

American journal of numismatics.

New York : American Numismatic Society, 1989-

<http://hdl.handle.net/2027/inu.30000025519863>

HathiTrust



www.hathitrust.org

Creative Commons Attribution-NonCommercial-ShareAlike

http://www.hathitrust.org/access_use#cc-by-nc-sa-4.0

This work is protected by copyright law (which includes certain exceptions to the rights of the copyright holder that users may make, such as fair use where applicable under U.S. law), but made available under a Creative Commons Attribution-NonCommercial-ShareAlike license. You must attribute this work in the manner specified by the author or licensor (but not in any way that suggests that they endorse you or your use of the work). This work may be copied, distributed, displayed, and performed - and derivative works based upon it - but for non-commercial purposes only (if you are unsure where a use is non-commercial, contact the rights holder for clarification). If you alter, transform, or build upon this work, you may distribute the resulting work only under the same or similar license to this one. Please check the terms of the specific Creative Commons license as indicated at the item level. For details, see the full license deed at <http://creativecommons.org/licenses/by-nc-sa/4.0>.

American Journal of Numismatics, Second Series

B

AMERICAN JOURNAL OF NUMISMATICS

7-8



Second Series, continuing
The American Numismatic Society Museum Notes

THE AMERICAN NUMISMATIC SOCIETY
NEW YORK
1895-96

THE AMERICAN NUMISMATIC SOCIETY

Founded 1858 · Incorporated 1865

BROADWAY BETWEEN 155TH AND 156TH STREETS
NEW YORK, N.Y. 10032

PURPOSES: The Society was founded for the collection and preservation of coins, medals, decorations and paper money and for the investigation of their history and other subjects connected therewith.

MEMBERSHIP: Applications for membership are welcomed from all interested in numismatics. Inquiries regarding membership should be addressed to the Secretary of the Society.

DUES: The annual dues for an Associate Membership are \$40.00. Issues of the *American Journal of Numismatics* (formerly *Museum Notes*), the *Annual Report*, and the quarterly *Newsletter* are distributed to all members in good standing.

PUBLICATIONS: The *American Journal of Numismatics* is a scholarly journal containing articles on numismatic topics. The Numismatic Notes and Monographs consist of separately issued publications, each on a single topic. Numismatic Studies is a series accommodating works in a larger format. *Numismatic Literature*, published twice a year, is an international abstract bibliography of the current literature in the profession. Ancient Coins in North American Collections publishes private collections. The Society is also engaged in the systematic publication of its entire Greek coin collection in *Sylloge Nummorum Graecorum: The American Numismatic Society*. Following the annual Coinage of the Americas Conference, the papers presented are edited and published.

MUSEUM: The Society maintains a museum located in uptown Manhattan, New York City, which houses its offices, collections and library. Collections embrace coins of all periods from their inception to modern times, medals, and decorations. Selections from its cabinets are on display in an exhibition. The library, consisting of over 90,000 titles, covers all branches of numismatics.

The museum is open to Members and the public from 9 A.M. to 4:30 P.M. on Tuesdays, Wednesdays, Thursdays, Fridays, and Saturdays. In addition, the public exhibition is open on Sundays from 1 to 4 P.M. The museum is closed on Mondays and the following holidays: New Year's Day, Lincoln's Birthday, Independence Day, Election Day, Thanksgiving Day, the fourth Friday in November, the fourth Saturday in November, December 24, Christmas Day. The public exhibition is open to the public from 10 A.M. to 4:30 P.M. on the fourth Friday and the fourth Saturday of November.

American Journal of Numismatics, Second Series

~~AMERICAN JOURNAL~~ OF NUMISMATICS

7-8

(New York, N.Y.: 1987)



CS
1
.A516
no. 7-8

Second Series, continuing
The American Numismatic Society Museum Notes

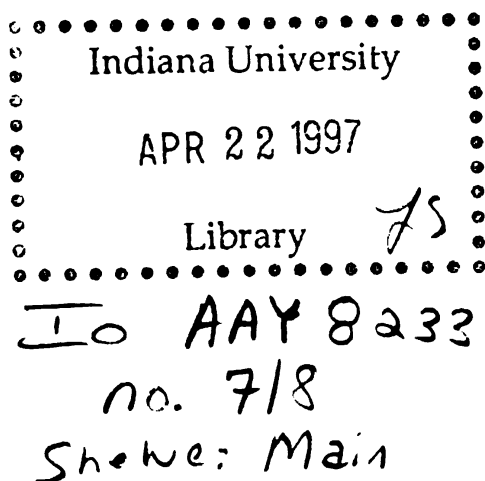
THE AMERICAN NUMISMATIC SOCIETY

NEW YORK

1995-96

© Copyright 1997
The American Numismatic Society

ISSN 0145-1413
ISBN 0-89722-265-2



COMPOSED AND PRINTED IN BELGIUM AT CULTURA, WETTEREN

CONTENTS

GREEK

MICHAEL IERARDI. The Tetradrachms of Agathocles of Syracuse: A Preliminary Study	1
DAVID SELLWOOD. The "Victory" Drachms of Phraates IV	75
ED DOBBINS. Countermarked Characene Tetradrachms of Attambelos IV	83

ROMAN AND BYZANTINE

RICHARD G. McALEE. Vespasian's Syrian Provincial Coinage	113
WILLIAM E. METCALF AND WILLIAM J. FULCO, S. J. Coins from the Excavations at Tell Nimrin	145
Y. T. NERCESSIAN. Two Silver Coins of Gosdantin III of Cilician Armenia	155

ISLAMIC

NEZIHI AYKUT. Some Coins of Mas'ūd I, Qilijarslān II, and the Maliks	161
-------------------------------------------------------------------------	-----

MODERN

JOHN M. KLEEGER. Reconstructing the Beach-Grünthal Hoard of Counterfeit Halfpence: The Montclair, New Jersey (1922) Hoard	187
---------------------------------------------------------------------------------------------------------------------------------	-----

TECHNOLOGY

PAUL T. KEYSER. Greco-Roman Alchemy and Coins of Imitation Silver	209
GILES F. CARTER. The Chronology of Augustan Asses and Quadrantes Determined from Chemical Compositions	235

BOOK REVIEWS

ANCIENT

- VINOGRADOV AND KRYZICKIJ, *Olbia, Eine altgriechische Stadt im nordwestlichen Schwarzmeerraum*. Elena Stolyarik 251
- HAZZARD AND WEISER, *Ptolemaic coins*. Catherine C. Lorber 256
- BERGER, *Die Münzen der Römischen Republik im Kestner-Museum Hannover*. Richard Schaefer 276
- CALLEGHER, ASOLATI AND CRISAFULLI, BERNARDELLI ET AL., *catalogues of Roman finds from Treviso and Venice*. Roger Bland 287
- HOLLSTEIN, *Die stadtrömische Münzprägung der Jahre 78-50 v. Chr. zwischen politischer Aktualität und Familienthematik: Kommentar und Bibliographie*. Jane DeRose Evans 289
- KOKKINOS, *Antonio Augusta: Portrait of a Great Roman Lady*. Susan Wood 293
- KENT, *The Roman Imperial Coinage*, vol. 10, *The Divided Empire and the Fall of the Western Parts AD 395-491*. Ralph W. Mathisen 299

ORIENTAL

- ALLOUCHE, *Mamluk Economics, A Study and Translation of Al-Maqrizī's Ighāthan*. Warren C. Schultz 305
- SANDROCK, *Copper Cash and Silver Taels*. Frederic G. Withington 311

THE TETRADRACHMS OF AGATHOCLES OF SYRACUSE: A PRELIMINARY STUDY

(PLATES 1-11)

MICHAEL IERARDI

Agathocles of Syracuse, the first hellenistic king in Sicily, rose to prominence as a soldier and mercenary commander. In 317 B.C. he seized control of Syracuse in a bloody coup and for over a decade waged war on both the cities of Greek Sicily and the Carthaginians. In imitation of the Diadochoi he declared himself king in 304 and, until his death in 289 B.C., he was the uncontested ruler of eastern Sicily and an influential force in southern Italy and the Adriatic.¹

¹ The chief literary sources for Agathocles' career are Diodorus of Sicily, 19.1-9, 65, 70-72, 102-104, 106-110; 20.3-18, 29-34, 38-44, 54-72, 79, 101; 21.2-4, 8, 15-17; and Justin's epitome of Pompeius Trogus, 22-23.2. The minor sources are conveniently collected by H. Berve, *Die Tyrannis bei den Griechen*, vol. 2 (Munich, 1967), pp. 728-31. For modern discussions, see K. Meister, "Agathocles," *CAH*² 7, 1 (Cambridge, 1984), pp. 384-411; S. Consolo Langher, "La Sicilia dalla scomparsa di Timoleonte alla morte di Agatocle. L'introduzione della 'Basileia,'" in E. Gabba and G. Vallet, eds., *La Sicilia antica* 2, 1 (Naples, 1979), pp. 289-342; and H. Berve, "Die Herrschaft des Agathokles," *SB Münch* 1952, vol. 5, pp. 1-77.

Research for this paper was begun during the 1990 Graduate Seminar at the American Numismatic Society. The author thanks the ANS staff, in particular Carmen Arnold-Biucchi, Curator of Greek coins. Earlier drafts of this paper were read with encouragement by E. S. Gruen, R. C. Knapp, R. R. Holloway, and M. J. Price; I have profited from suggestions by R. S. Stroud and R. J. A. Talbert.

Agathocles' coinage in gold, silver, electrum, and bronze is generally well known. G. K. Jenkins has devoted an influential study to the electrum, while the bronze issues have recently been examined in detail by R. R. Holloway. As yet there has been no systematic treatment of his silver, even though the two issues of pegasi and the two series of tetradrachms arguably represent the bulk of Agathocles' precious metal coinage. Little if any work has been done on the gold.² This relative neglect may explain why discussion of early hellenistic coinage in Sicily often overlook Agathocles and begin with Hieron II.³ There is a clear need for a comprehensive study of Agathocles' coinage, especially the precious metal issues. This paper provides preliminary die studies of the most substantial silver issues, the Arethusa/quadrige tetradrachms and the Kore/Nike with trophy tetradrachms.⁴

Final revision was underwritten by a grant from the Stahl Fund of the University of California, Berkeley. The author also thanks S. Cox for invaluable editorial help.

² Electrum: G. K. Jenkins, "Electrum Coinage at Syracuse," in C. M. Kraay and G. K. Jenkins, eds. *Essays in Greek Coinage Presented to Stanley Robinson* (Oxford, 1968), pp. 145–54. Bronze: R. R. Holloway, "The Bronze Coinage of Agathocles," in O. Mørholm and N. M. Waggoner, eds., *Greek Numismatics and Archaeology: Essays in Honor of Margaret Thompson* (Wetteren, 1979), pp. 87–95. The most recent overview of Agathocles' coinage is V. Buda, "Le emissioni siracusane negli ultimi due decenni del sec. iv a.C. ed il significato della riforma monetaria di Agatocle," *Helikon* 9/10 (1969/70), pp. 193–231, who follows in general terms the schema of HN, pp. 180–82. That synopsis was in turn based upon Head's *History of the Coinage of Syracuse* (London, 1874), which is still the only comprehensive treatment of Syracusan coinage. On the reduced-weight pegasi, see now R. Cantilena, "La riduzione ponderale a Siracusa," *Dialoghi di Archeologia*, ser. 3, vol. 7/2 (1989), pp. 9–20. Jenkins, pp. 151–52, alludes to die counting of the late gold pieces, but results were never published.

³ O. Mørholm, *Early Hellenistic Coinage from the Accession of Alexander to the Peace of Apamea* (Cambridge, 1991), is the most recent example.

⁴ These die studies are preliminary, in that they do not as yet include all known examples of the coinage, but are based upon the photo file (chiefly twentieth century auction catalogues) and collection of the ANS, other collections published in the SNG and ACNAC formats, and from the British Museum; not yet included are other European collection. This paper, therefore, makes no claim to completeness. Nevertheless, the computer simulations discussed below (nn. 7–8) suggest that the samples observed are statistically representative.

ARETHUSA/QUADRIGA SERIES

The early Agathoclean tetradrachms feature traditional Syracusan types (Plate 1, 1–2). The obverse shows a female head, usually identified as the Syracusan fountain nymph Arethusa, wearing a necklace, earrings, and a wreath of reed. She faces left, surrounded by three dolphins. At the base of her neck the letters **NI**, **NK**, **ΝΚ** or **ΦΙ** can often be read, although off-center striking of the flan or heavy wear can make this identification difficult on individual coins. The reverse type is a quadriga galloping left. The charioteer wears a long chiton, his left hand holds the reins and his right a *kentron*, or goad, extended over the horses. Above the *kentron* is a triskeles. The legend **ΣΥΡΑΚΟΣΙΩΝ** and the monogram **Α** appear in exergue.⁵

This series is widely acknowledged to be Agathoclean on the basis of the triskeles and the hoard evidence, and it is earlier than the Kore/Nike with trophy series on the basis of the hoards and the reverse legends.⁶ Both the Arethusa head and the quadriga recall, in updated style, the Euaenetus decadrachms of the early fourth century. The choice of type can be viewed as essentially conservative. Yet the revival of types associated with Dionysius and war with Carthage can scarcely have been coincidental, since Sicily was again preparing for war between Syracuse and Carthage. The tetradrachm had not been struck at Syracuse since the days of Dionysius, and the use of this denomination suggests increased expenditure for major military preparations. Agathocles may have been competing with the Carthaginians for available mercenaries and the recognized and reliable types would have helped ensure the acceptability of his silver.

⁵ Arethusa: C. M. Kraay, *Greek Coins* (London, 1966), p. 293, 134, and *SNGANS* 632. Other candidates for the obverse include Persephone: *HN*, p. 181, Buda (above, n. 2), p. 194, W. Giesecke, *Sicilia Numismatica* (Leipzig, 1923), p. 87, and A. Holm, *Storia della moneta siciliana* (Bologna, 1965), p. 187, 416; and Kyane: D. White, "The Morris Coin," *Expedition* 28 (1986), pp. 13–21. The iconography of Arethusa is discussed in *LIMC* 2.1, s.v. "Arethusa" (Cahn). The reverse charioteer is sometimes described as female, Head, *Syracuse* (above, n. 2), p. 44; Kraay (above, n. 5), p. 293, 134. On the triskeles, see A. Burnett, "The Coinages of Rome and Magna Graecia in the Late Fourth and Third Centuries B.C.," *SNR* 56 (1977), pp. 119–20.

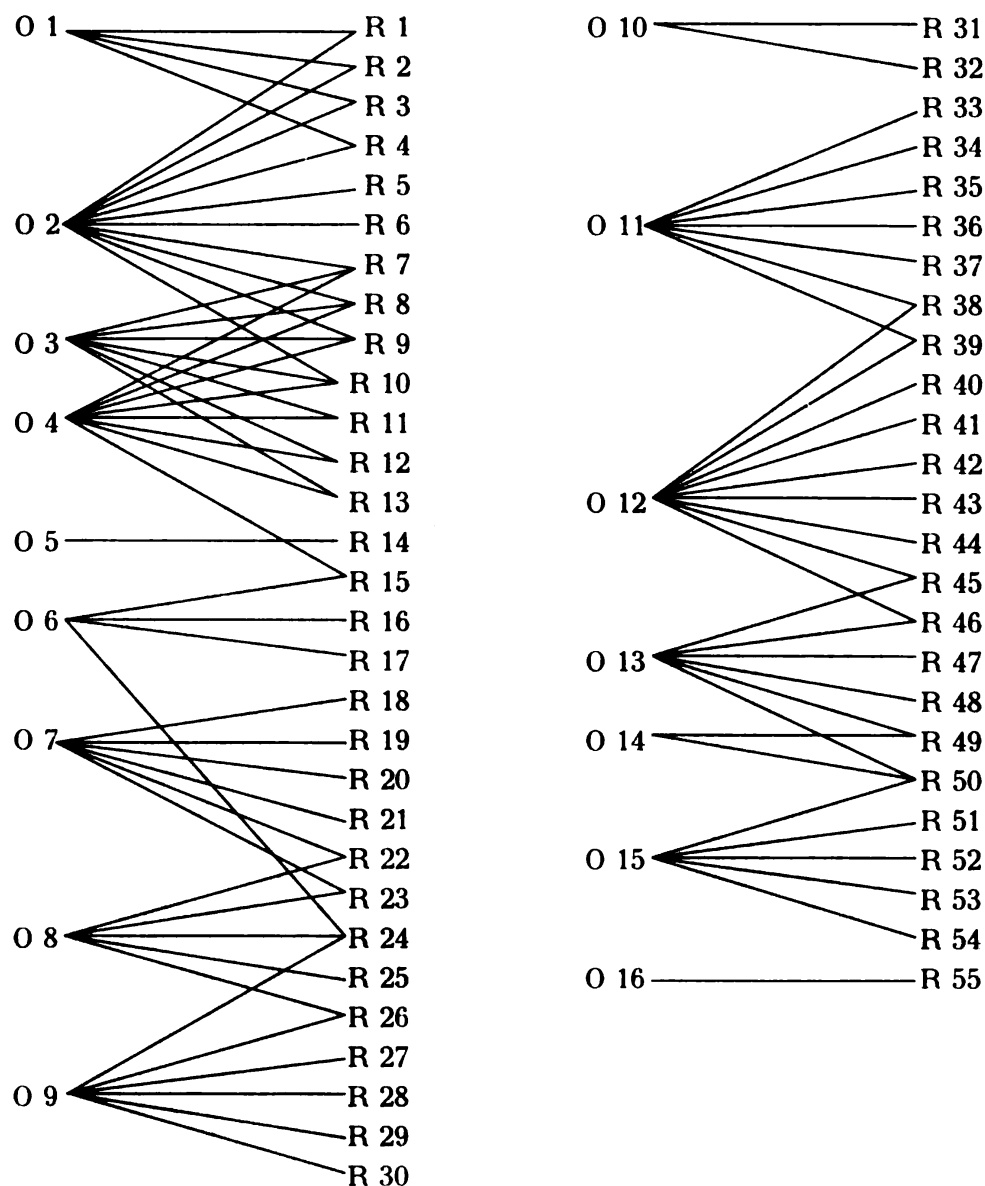
⁶ K. Christ, "Zur Chronologie der syrakusanischen Münzprägung des 4. Jahrhunderts v. Chr.," *JNG* 8 (1957), pp. 27–29; Jenkins (above, n. 2), p. 151.

Chart 1. Arethusa/Quadriga

Obv. Head of Arethusa l., with necklace, earrings, and wreath, surrounded by three dolphins; below neck \aleph (O 1, 2), \aleph (O 3–7), \aleph (O 8, 9), or Φ (O 10–16)

Rev. Quadriga l., charioteer in chiton, reins in l., kentron in r., triskeles above; $\Sigma\Upsilon\text{PAKO}\Sigma\text{I}\Omega\text{N}$ and \aleph in exergue

Combinations 1–84.



A study of 326 examples has revealed the die linkages shown in chart 1. The coverage estimator devised by I. S. Good, which estimates the percentage of the original coinage volume that was struck from observed dies, Table 1a, shows that this sample is very close to representative.⁷ Table 1b assumes that the die output was equal and Table 1c gives figures based on Carter's formula.⁸

TABLE 1A

Good's Estimator

	<i>Obverse dies</i>	<i>Reverse dies</i>	<i>Combinations</i>
Coins	16	55	84
Coverage estimate	99.6%	99.0%	94.1%
95% confidence interval	98.6/100%	96.6/100%	89.8/98.2%

TABLE 1B

Assuming Equal Die Output

	<i>Obverse dies</i>	<i>Reverse dies</i>	<i>Combinations</i>
Coins	16	55	84
Die estimate	16.0	55.5	88.2
95% confidence interval	16/16.2	55/56.9	84.5/92.4

⁷ I. J. Good, "The Population Frequencies of Species and the Estimation of Population Parameters," *Biometrika* 40 (1953), pp. 237-64, cited by W. Esty, "Estimation of the Size of a Coinage: A Survey and Comparison of Methods," *NC* 1986, p. 208. The calculations presented in this paper follow the recommendations of Esty, in particular his equations J2, J3, and K1 (pp. 208-9). The figures are carried to one decimal place, but may not be any more precise than the nearest integer. W. Esty and G. Carter, "The Distribution of the Number of Coins Struck by Dies," *AJN* 3-4 (1991-92), pp. 165-86, appeared too late to be taken into consideration here. On the provenience of the sample, see n. 4 above.

⁸ G. F. Carter, "A Simplified Method for Calculating the Original Number of Dies from Die Link Statistics," *ANSMN* 28 (1983), pp. 195-206, especially equation 3 on p. 202. Figures are rounded to two decimal places.

TABLE 1C

G. F. Carter's Estimator

	<i>Obverse dies</i>	<i>Reverse dies</i>	<i>Combinations</i>
Coins	16	55	84
Carter projections	15.57 \pm .19 [sic]	59.35 \pm 1.41	98.61 \pm 3.01

A preliminary catalogue of known dies of the Arethusa/quadrige series is illustrated in Plates 2 (obverses) and 5–7 (reverses). The series divides distinctly and fairly evenly into two groups: a nu group (bearing the letters NI, NK, or N), and a phi group (letters ΦI). The letters are probably mint control devices, not artists' signatures, since the initials NI and N also appear on some Agathoclean bronze issues. Even though the letters of the nu group can be resolved into a name beginning Nik-, none of Agathocles' known associates has a name beginning Nik- or Ph-. Within each of the two groups there are numerous shared reverse dies, suggesting multiple anvils in simultaneous production, but there are no connections between the nu and phi groups. The two groups may have been struck contemporaneously at different workshops or at the same workshop in quick succession, because hoards containing the series have both nu and phi groups. The survival rate for the phi group is considerably lower than for the nu group (100 versus 226 examples), in spite of rough equivalence in number of dies. The survival rate may reflect original production, suggesting that the phi group dies were originally less productive than the nu group dies.

KORE/NIKE WITH TROPHY SERIES

The second series of Agathoclean tetradrachms is strikingly original in both type and legend, and highly variable in matters of detail (Plate 1, 3–4). The obverse shows the head of Kore, usually facing right, wearing a necklace, earrings, and a wreath made of a stalk bearing a full ear of grain. Her hair flows loosely about her neck and shoulders. This loose hairstyle is without precedent in Syracusan coinage, yet the type proved quite popular, reappearing on the coins of the Fourth Democracy, Pyrrhus, and Hieron II. Along the left edge appears the

legend **KOPΑΣ**, the Doric genitive of Kore, “the Maiden,” an epithet of Persephone.

On the reverse a winged female figure stands at left, naked to the hips, with a hammer in her right hand and a nail in her left; she is preparing to nail a helmet to a freestanding trophy. The legend **ΑΓΑΘΟΚΛΕΟΣ** appears in exergue or along the left edge, or the variant **ΑΓΑΘΟΚΛΕΙΟΣ** along the left edge. A triskeles appears invariably, and the monogram **Α** or **Μ** occasionally, but the position of these emblems with the reverse composition varies greatly. Some dies are of exceedingly fine workmanship, while others, traditionally labeled “barbarous,” are crudely worked.⁹ The nearest numismatic precedent for the reverse type would seem to be a gold stater of ca. 360–350 B.C. from Lampsacus, featuring a crouching half-nude Nike assembling a trophy. No example has been found in Sicily, and it is unlikely that the Lampsacene stater directly influenced the Agathoclean design. Much closer to—and in my opinion dependent upon—the Agathoclean Nike is the Nike crowning a trophy on the reverse of a Seleucid tetradrachm (Plate 1, 16), traditionally dated to the immediate aftermath of the battle of Ipsus (301 B.C.).¹⁰

Chart 2. Kore/Nike with Trophy

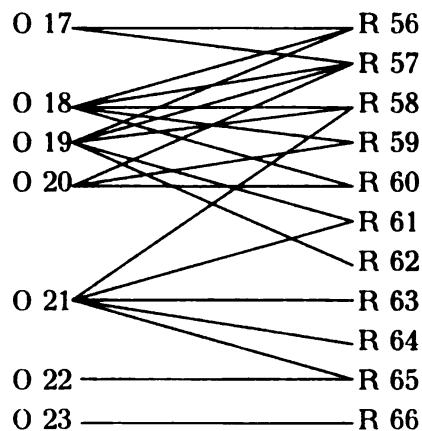
A–D, fine style

- Obv.* Head of Kore facing r. with earring, necklace, and grain in hair; to l. reading up **KOPΑΣ** (A–C)
- Rev.* Nike and trophy, in r. hammer, in l. nail; triskeles in r. field, to l. reading up **ΑΓΑΘΟΚΛΕΙΟΣ** (B–D), ground line

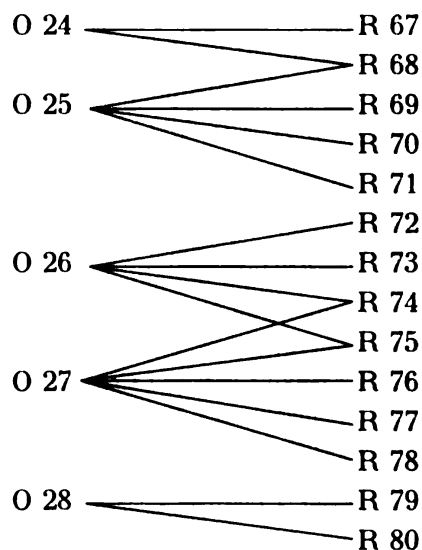
⁹ Variations in legend and position of monogram and triskeles provide the basis for the separate groups of this series, and are noted more fully in the catalogue and die link charts. The distinction between “fine” and “barbarous” styles goes back at least to Head, *Syracuse* (above, n. 2), p. 48.

¹⁰ Lampsacene stater: G. K. Jenkins, *Ancient Greek Coins* (London, 1972), p. 127, 288 (hereafter *AGC*); A. R. Bellinger and M. A. Berlincourt, “Victory as a Coin Type,” *ANSNM* 149 (New York, 1962), p. 24. Seleucid tetradrachm: Jenkins, *AGC*, p. 224, 552. C. Isler-Kerényi, “Nike mit dem Tropaion,” *Antike Plastik* 10 (1970), p. 63, conjectures that the Agathoclean reverse depicted a sculptural group commissioned to celebrate Agathocles’ victory in Africa.

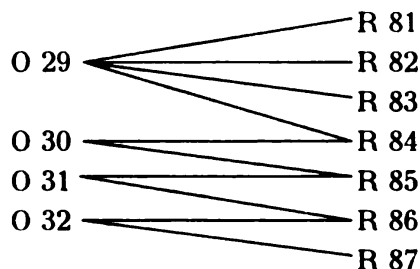
- A, Combinations 85–106. Obv. side and back tresses differentiated. Rev. **ΑΓΑΘΟΚΛΕΟΣ** in exergue (R 56, 57, 61–64) or to l. reading up (R 58–60, 65, 66); in l. field **Α** (R 56–59, 61–63) or **Λ** (R 60, 64–66); no necklace on Nike.



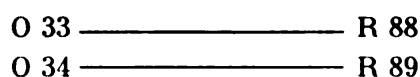
- B, combinations 107–24. Obv. tresses less separated. Rev. Nike stiffer and stockier, triskeles often counterclockwise (R 72, 74–76, 79, 80), necklace (except R 67).



C, combinations 125–34. Obv. little or no gap in tresses. Rev. Nike leans slightly backward, necklace.



D, combinations 135–36. Obv. **ΣΥΡΑΚΟΣΙΩΝ** to r. reading down.

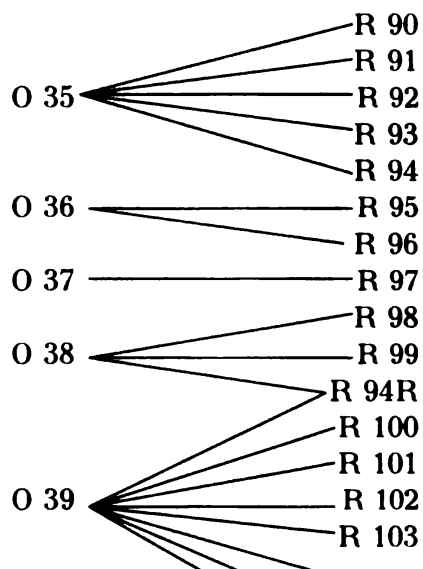


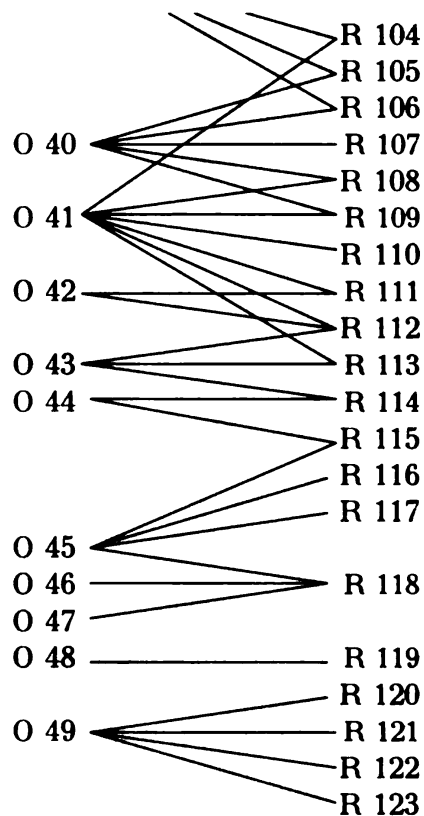
E–J, barbarous style

Obv. Kore facing r., to l. reading down **ΚΟΡΑΣ** (E–H)

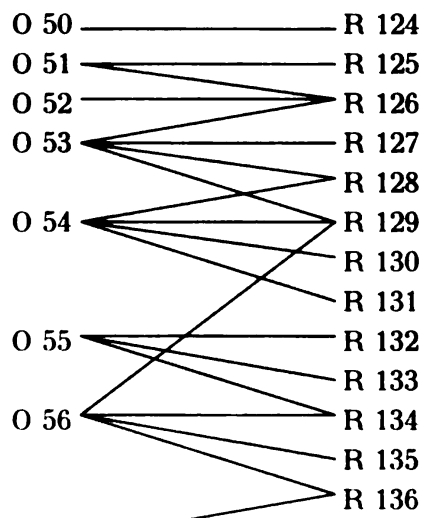
Rev. Nike and trophy, ground line, to l. reading up **ΑΓΑΘΟ-ΚΛΕΙΟΣ** (E–I), triskeles in l. field (E–I)

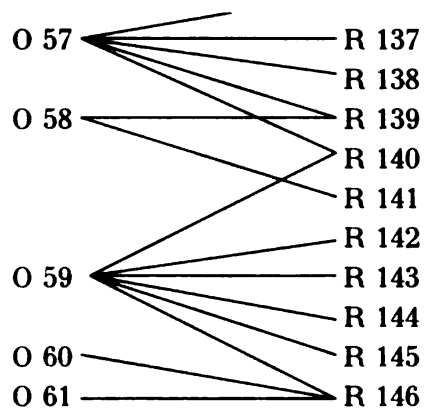
E, combinations 137–84. Obv. lettering small, closely set, head often small. Rev. triskeles counterclockwise (R 94, 94R, 104), no ground line (R 102, 105, 110, 112, 114, 120).



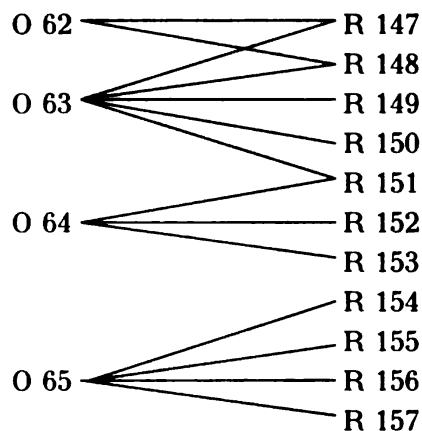


F, combinations 185–218. Obv. coarse hair. Rev. legend in exergue (R 126), triskeles counterclockwise (R 135, 140).

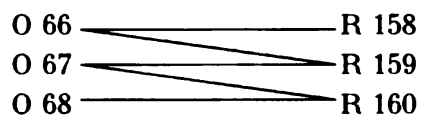




G, combinations 219–32. Rev. no ground line (R 148, 151).

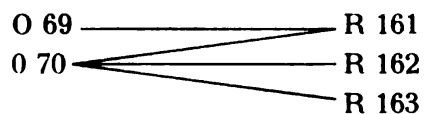


H, combinations 233–37. Rev. no ground line (R 158, 160).

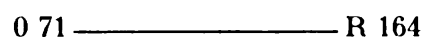


I, combinations 238–41. Obv. Kore facing l., to r. reading up ΚΟΡΑΣ.

Rev. no ground line (R 163).



J, combination 242. Obv. to r. reading down ΑΓΑΘΟΚΛΕΙΟΣ. Rev. no legend, triskeles in r. field.



The die linkages for this series are shown above in Chart 2. Calculations according to the Good estimator demonstrate that the 399 coins so far examined, while not as complete a sample as the 326 examples of the Arethusa/quadrige series summarized above, are still fairly representative.

TABLE 2A

Good's Estimator

	<i>Obverse dies</i>	<i>Reverse dies</i>	<i>Combinations</i>
Coins	55	110	158
Coverage estimate	98.4%	92.7%	86.7%
95% confidence interval	96.3/100%	88.9/96.5%	81.8/91.6%

TABLE 2B

Assuming Equal Die Output

	<i>Obverse dies</i>	<i>Reverse dies</i>	<i>Combinations</i>
Coins	55	110	158
Die estimate	55.8	118.6	182.2
95% confidence interval	55/57.1	113.9/123.7	172.4/193.1

TABLE 2C

G. F. Carter's Estimator

	<i>Obverse dies</i>	<i>Reverse dies</i>	<i>Combinations</i>
Coins	55	110	158
Carter projections	57.72 \pm 1.10	131.15 \pm 3.79	214.91 \pm 7.92

A partial die catalogue of known Kore/Nike with trophy is illustrated in Plates 2-4 and 7-11. Further study should reveal more die combinations, permitting consolidation both within and among many of the groups identified. Future links should be expected particularly among barbarous style groups. In some cases, dies have been tentatively assigned to groups with which they have no links on the basis of shared compositional anomalies. For example, because of the counter-

clockwise triskeles on R 79 and R 80, O 28 is assigned to group B, which contains all other known counterclockwise triskeles reverses in the fine style (R 72, R 74, R 75, R 76). On the other hand, stylistically disparate dies are linked in some groups. For example, group F contains both the small head varieties, such as O 51, and the large head varieties, such as O 59, clearly by different hands. Thus nothing about the style of die cutting would prevent the consolidation of many of the barbarous groups.

The traditional distinction between fine and barbarous styles, though subjective, seems borne out by this die study. The fine obverses are invariably paired with fine reverses. No link between fine and barbarous dies can be demonstrated. The artistically better examples of the barbarous style (O 51 of group F, or O 69 of group I), which might have been expected to provide a transition between the two styles, show little likelihood of future connection to any of the fine style groups.

The ratio of known reverse dies to obverse dies seems roughly comparable for the two styles (fine, 1.89; barbarous, 2.05), and the average number of combinations per obverse die is very close (fine, 2.89; barbarous, 2.86). A glance at Chart 2, however, shows that the incidence of crossed lines, representing reverse dies shared by multiple obverse dies, is higher in the fine than in the barbarous style. A reasonable explanation for the high incidence of shared reverses is multiple anvils in simultaneous production, with reverse dies mixed in a die box. Such a procedure would imply intense striking of perhaps shorter duration. Thus the sloppiness of execution of the barbarous style dies is not necessarily due to pressure on minting authorities for rapid production, since as a whole the barbarous groups are no more hurried than the fine.

Some other explanation is therefore required for the poor quality of the barbarous style coins. The most common suggestion has been that the barbarous coins were minted in Africa by a mobile mint during Agathocles' invasion of 310–307 B.C., while the fine coins were struck at Syracuse.¹¹ In support of this interpretation it is often proposed

¹¹ *HN*, p. 182; Giesecke (above, n. 5), pp. 90–91; Holm (above, n. 5), p. 190; Buda (above, n. 2), 204.

that the monogram **A**, which appears on some coins of the fine style (group A), should be resolved as **AN(TANΔPOY)**. Antander was Agathocles' elder brother and *ἐπιμελητής* of Syracuse during the African invasion (Diod. 20.4.1). The hypothesis of the African mint has the further advantage of explaining how Agathocles' African army was paid during the extended campaign, since the barbarous style coins are demonstrably numerous. Nevertheless, there are serious difficulties with this view. The hoard evidence as yet does not support the supposition that the Nike series ever circulated outside Sicily. Admittedly few North African hoards of this period have been reported; but none contains Agathoclean coins. We do not in fact know that the African army was paid regularly in new coin.¹² If the barbarous tetradrachms were struck only in Africa, it is difficult to see how they have come to be found in such numbers in Sicily, since Agathocles abandoned the army in Africa. Finally, the matter of the monogram is not straightforward. Only group A of the fine style bears the monogram **A**. Why groups B, C, and D do not also bear the monogram if they were struck in Syracuse while Antander was *epimeletes* is not satisfactorily explained. Since this monogram appeared in the reverse exergue of the Arethusa/quadrige series, by the same logic Antander should also have served as *epimeletes* or moneyer during production of the earlier tetradrachms. This is of course not impossible, but the idea has found no support. In fact, there is no certainty that the monogram should be resolved as a name beginning An- rather than Ai.¹³

¹² The episode at Diodorus 20.33.8, where Agathocles' soldiers complain about back pay, suggests rather strongly the contrary. Diodorus notes at length the measures Agathocles took to placate this mutiny and distributing money was not one of them. Agathocles' soldiers will have left no numismatic trace of their sojourn in Africa if, as I suspect, their chief income was booty, "gifts" from Libyan allies, and the contents of Ophellas's campaign chest. Nevertheless, the notion of an Agathoclean coinage in Africa retains a tenacious hold in some quarters. A recent fixed price list (Seaby, August 1981, BG21) suggested that an African origin might even explain the inartistic qualities of some dies of the (presumably pre-310 B.C.) Agathoclean Apollo/biga gold drachm.

¹³ Giesecke (above, n. 5), p. 90, claimed that the form **A** is more common than **A**; in fact the opposite is true.

A. H. Lloyd recognized the problems inherent in the African mint theory, concluding instead that the barbarous style tetradrachms were Carthaginian or Siculo-Punic imitations of the Syracusan fine style series.¹⁴ The decline in artistic quality from fine to barbarous Lloyd likened to the differences between the Raš-Melqart Arethusa/quadrige tetradrachms and their Euaenetus-type Syracusan models. Yet the Raš-Melqart imitations did not copy the Syracusan legend, and Lloyd's attempts to explain why Carthaginian imitations of the fine style would have retained the triskeles and the ΑΓΑΘΟΚΛΕΙΟΣ legend are more ingenious than persuasive. There are no cogent reasons to suppose the barbarous style coins were minted anywhere other than Syracuse.

The problem of the barbarous style coins is in fact not limited to the Kore/Nike tetradrachms. The head of Apollo/biga gold drachms (Plate 1, 5), the full-weight silver pegasi (Plate 1, 6), and the reduced-weight silver pegasi (Plate 1, 7) all exhibit great variety in the competence of die engraving. I believe further study of Agathocles' gold and silver coinage will support the hypothesis of two ateliers within the Syracusan mint, one of higher artistic competence than the other. The Arethusa/quadrige series is remarkable in that there is little difference in quality of die engraving between the nu and phi groups.

It has long been noted that, as a whole, the coinage of Agathocles can be used to illustrate the increasing authority of the tyrant.¹⁵ His earliest coins bear the legend ΣΥΡΑΚΟΣΙΩΝ and the only reference to Agathocles personally is the presence of the triskeles. Gold and silver coins of Agathocles' middle period bear his name, while gold and bronze coins of his final period bear his name and royal title. In an influential early discussion of Agathocles' tetradrachms, F. Kenner argued that this same evolution of Agathocles' power can be traced within the groups of the Kore/Nike with trophy series itself.¹⁶ On

¹⁴ A. H. Lloyd, "A Recently Discovered Hoard of Greek and Siculo-Punic Coins," *NC* 1925, pp. 168–71.

¹⁵ *HN*, p. 182; G. F. Hill, *Historical Greek Coins* (London, 1906), pp. 111–12.

¹⁶ F. Kenner, *Die Münzsammlung des Stiftes St. Florian* (Vienna, 1871), pp. 14–15. This interpretation is explicitly adopted by Head, *Syracuse* (above, no. 2), p. 48, and Buda (above, n. 2), pp. 204–7. It is implied by the arrangement of Holm (above, n. 5), p. 190. The fullest exposition is Giesecke (above, n. 5),

this interpretation the earliest of this series was group D, which retained the traditional legend **ΣΥΠΑΚΟΣΙΩΝ** on the obverse. Then followed groups B and C, on which **ΣΥΠΑΚΟΣΙΩΝ** was displaced by the new obverse legend **ΚΟΡΑΣ**. In all three groups the reverse legend is the (presumably less assertive) adjectival form **ΑΓΑΘΟΚΛΕΙΟΣ**. The barbarous style groups were based upon the design of groups B and C. Finally, Agathocles arrogated to himself the right to coin silver in his own name, and altered the reverse legend to the more assertive genitive form **ΑΓΑΘΟΚΛΕΟΣ** (group A).

The present die study and the recent publication of previously little known examples of a rare Agathoclean gold stater raise serious doubts about the sequence posited by Kenner. Specimens from group D come from only two obverse dies. The presumption should be that coins with the obverse legend **ΣΥΠΑΚΟΣΙΩΝ** were never very numerous. Both the legend **ΣΥΠΑΚΟΣΙΩΝ** and the monogram **Α** appear regularly on the Arethusa/quadrige series. Thus both group D (legend **ΣΥΠΑΚΟΣΙΩΝ** and group A (the only group with the monogram) have valid numismatic claims to close connection with the Arethusa/quadrige series, and thus priority within the Kore/Nike with trophy series. The placement of the reverse legend in the exergue in the majority of group A examples might support the precedence of this group, since in virtually all other groups the legend appears along the left border. The repositioning of the legend along the border increased its prominence and legibility. The legend of the Arethusa/quadrige reverses also appeared in the exergue, which might be another reason to suppose group A is early in the Kore/Nike with trophy series. Most importantly, it can now be demonstrated that the spelling **ΑΓΑΘΟΚΛΕΟΣ** (group A) is earlier than **ΑΓΑΘΟΚΛΕΙΟΣ** (groups B and C).

One of the rarest Sicilian coins is an Agathoclean gold stater (on the Attic standard), until recently known chiefly from the example in the Vienna Münzkabinett (Plate 1, 8).¹⁷ The obverse depicts a youthful

pp. 89–91. Among historians the believers include Berve, "Herrschaft" (above, n. 1), p. 69.

¹⁷ On this coin, see the still important discussion of A. J. Evans, "Contributions to Sicilian Numismatics," *NC* 1894, pp. 237–42 and pl. 8, fig. 6. Evans evidently knew of another example in a private collection, but it was never published, and

head facing right, wearing an elephant headdress and an aegis around the neck. There is no legend. On the reverse, a winged Athena strides right, in a pose reminiscent of Athena Promachos or Alkidemos. She wears a helmet and holds a shield on her left arm, a spear in her upraised right, and an owl appears in the lower right field. The reverse legend of the Vienna coin reads ΑΓΑΘΟΚΛΕΟΣ. The types are derived from those of a silver tetradrachm struck by Ptolemy I Soter (Plate 1, 9), often dated ca. 314–305 B.C.¹⁸ On the basis of the legend and the iconography of the reverse, the Agathoclean stater is universally assumed to be roughly contemporary with the Kore/Nike with trophy tetradrachms.

Evans and Hill are unsure of the identity and the gender of the obverse figure. Evans acknowledged that “it is by no means certain who is intended to be portrayed by the youthful head.” Hill tentatively identified the figure as a personification of Africa, who in later Greek iconography is, however, usually female. The elephant head-dress covers the hair, so one must rely primarily on facial characteristics. The lips and chin could be those of a man or woman, but the well muscled and slightly bulging brow is arguably more “powerful” than “beautiful.” The lack of an earring may also be relevant. I am therefore inclined to call the head male. That a Syracusan audience would think of personified Africa without the aid of a legend seems dubious. Since on the Ptolemaic model the obverse head is presumably the deified Alexander, H. A. Cahn concludes that the youth on Agathocles’ coin is also Alexander, “wenn auch das Ammonshorn, das ihn kennzeichnet, hier nicht deutlich zu sehen ist.”¹⁹ Obviously

may be the same as the Basel coin discussed below. The denomination is sometimes described as 120 litrae: Holm (above, n. 5), p. 189; G. F. Hill, *Coins of Ancient Sicily* (Westminster, 1903), pl. 11.

¹⁸ Ptolemaic tetradrachm: Mørkholm (above, n. 3), pp. 63–65, 92–93; O. Zervos, “The Early Tetradrachms of Ptolemy I,” *ANSMN* 13 (1967), pp. 1–16; B. Kuschel, “Die neuen Münzbilder des Ptolemaios Soter,” *JNG* 11 (1961), pp. 9–18. Athena Promachos: C. M. Havelock, “The Archaistic Athena Promachos in Early Hellenistic Coinages,” *AJA* 84 (1980), pp. 41–50; Mørkholm (above, n. 3), p. 26.

¹⁹ Alexander: H. A. Cahn, *Griechische Münzen aus Grossgriechenland und Sizilien; Antikenmuseum Basel und Sammlung Ludwig* (Basel, 1988), p. 143. Agathocles: E. Sjöqvist, “A Portrait Head from Morgantina,” *AJA* 66 (1962), pp. 319–22; and, guardedly, E. Will, *Histoire politique du monde hellénistique*, 2nd ed., vol. 1 (Nancy,

Agathocles' die cutters took the effort to alter the types in some important respects, to make the gold coin refer fairly explicitly to Agathocles' African victory. Among these conscious alterations may have been to omit the Ammon's horn and to make the visage more generic. E. Sjöqvist argued that the obverse is an idealized portrait of Agathocles himself, but this view has not found wide acceptance. An official portrait tradition of Agathocles did exist in antiquity. Diodorus (21.16.6) records that upon Agathocles' death the Syracusans pulled down his images, and Cicero (*Verr.* 2.4.122–24) claims that Verres stole from the temple of Athena in Syracuse a panel depicting Agathocles in a cavalry skirmish. Yet no securely identified image has survived, and what little is reported about the tyrant's physiognomy does not greatly resemble the head on the gold coin. Nevertheless, the response of ancient audiences to such images was perhaps more sophisticated than some modern critics allow. A realistic portrait of Agathocles (51 years old and "not overly well provided with hair," as Diodorus says, before he ever set foot in Africa) is of course out of the question. But even his enemies allowed that Agathocles had been handsome as a younger man. An idealized portrait of "Agathocles as Alexander" seems to me quite possible.

We have no literary evidence that Agathocles likened himself to Alexander, or sought to portray the African expedition as a continuation of Alexander's conquests. The loss of the 22 books by Agathocles' court historian Callias of Syracuse and the hostility of most other contemporary historians have ensured that we in fact have little idea how Agathocles wanted his regime to be perceived. But Alexander's hostile intentions towards Carthage were widely believed by his contemporaries. Even if we reject the authenticity of Alexander's final plans as outlined by Diodorus (18.4), the presence at Susa of many ambassadors from the western Mediterranean attests unmistakably to the uncertainty and concern with which Alexander's intentions were viewed in the West. There is good reason to suppose that the Carthaginians gave serious thought to the danger of an attack by

1979), p. 117. One ancient literary tradition of Agathocles' appearance is reflected in Aelian, *VH* 11.4 and Diodorus 20.54.1. His youthful good looks: Diodorus 19.2.6; Justin 22.1.3.

Alexander on North Africa and that Agathocles was prepared to play upon Carthaginian fears.

The stater's reverse departs from the Ptolemaic original in two details. The addition of wings on the Agathoclean Athena associates her thematically with the reverse of the Kore/Nike with trophy tetradrachms. The owl replaces the eagle of the Ptolemaic tetradrachm, and may refer to the perhaps not altogether miraculous appearance of owls just before Agathocles' victory over Hanno and Bomilcar in 310 (Diod. 20.11).

Two more examples of this gold issue have recently been published. One is in the Basel Antikenmuseum (Plate 1, 10), the other was purchased from Bank Leu by a private collector. Both coins were struck from the same obverse and reverse dies as the Vienna piece, except that the reverse die has been recut to insert an iota between the epsilon and the omicron in the legend.²⁰ The reason for this alteration is perplexing, but the sequence is clear: **ΑΓΑΘΟΚΛΕΟΣ** preceded **ΑΓΑΘΟΚΛΕΙΟΣ**. Since the tetradrachms undergo exactly the same alteration in legend, their sequence must also be the same. Group A is therefore the earliest of the Kore/Nike with trophy series. The analogous alteration in legend makes it highly probable that the gold stater and the beginning of the Nike series are exactly contemporary, and it probably means that both denominations were struck at the same mint. As there is no firm reason to suppose any of the tetradrachms were produced outside Sicily, the stater was probably produced on the island. The effort in recutting the stater die and the consistency of the spelling **ΑΓΑΘΟΚΛΕΙΟΣ** throughout the later dies of the long and highly varied tetradrachm issue suggest that the spelling change was considered significant, but it is difficult to say how.

This sequence of legends is not surprising. Despite its popularity, the belief that the genitive of the name is more assertive than the adjectival form is conjectural. These gold staters and the Kore/Nike

²⁰ Cahn (above, n. 19), p. 143, 511; Leu 42, 12 May 1987, 133. The purchaser of the Bank Leu coin was kind enough to leave it temporarily at the ANS, where I was able to examine it in August 1992.

with trophy tetradrachms were the first Sicilian coins to bear any leader's name, in whatever form. The unprecedented claim made by these legends would not have been mitigated by an adjectival form. The motive for the alteration may have been merely technical. The obverse legend **KOPΑΣ** in the genitive identified the coin as being in some sense "of the Maiden," while the genitive **ΑΓΑΘΟΚΛΕΟΣ** on the reverse made a similar, perhaps competing, claim. The two legends may have perceived as formally in conflict. The adjective **ΑΓΑΘΟΚΛΕΙΟΣ** would make the same political point without seeming to dispute the honor with the goddess. Indeed, this might imply that the decision to alter the legend began with the silver in mind, since there was no obverse legend on the gold with which to stand in conflict. It may be worth noting that Agathocles' later coins with the reverse legend **ΑΓΑΘΟΚΛΕΟΣ ΒΑΣΙΛΕΟΣ** have either no competing obverse legend, or a name in the nominative.²¹

The manner of alteration of the legend on the gold staters sheds some light on the problem of legend interpretation. Considerable ingenuity has been expended on discovering the noun that **ΑΓΑΘΟΚΛΕΙΟΣ** may have modified. Since the same legend appears on both the gold and the silver, a monetary value, like *στατήρ*, seems unlikely. The feminine noun *νίκη* yields an appropriate sense,²² but would logically require a feminine adjective. The recutting of the gold stater die suggests that the spelling **ΑΓΑΘΟΚΛΕΙΟΣ**, rather than being a free and deliberate choice, may simply have been the alteration which required the least reworking of the die. Whether the legend was altered on the gold or the silver first depends in part on the motive for the change, which remains very much a matter for speculation.

²¹ No obverse legend: the helmeted Athena/thunderbolt, gold, reduced-weight stater (Plate 1, 11). Nominative obverse legend: Artemis **ΣΩΤΕΙΡΑ**/thunderbolt, bronze (Plate 1, 12).

²² Head, *Syracuse* (above, n. 2), p. 47, following the suggestion of Kenner. Head, *HN*, p. 182, later changed his mind in favor of *χαρακτήρ*, an Agathoclean "striking" or "issue," which probably remains the best guess. Buda (above, n. 2), p. 205, still favors *νίκη*. Adjectives formed from Greek personal names ending in -cles are normally three-termination.

VOLUMES AND VALUES

Estimating the original size of a coinage from its present remains is problematic. Yet with appropriate caution it is feasible to project the implications of die studies into the realm of economic history. In recent years the practice has been to compare issues by estimated number of obverse dies, and it is here that the most important finding of this study is made. The Kore/Nike with trophy series obverses outnumber those of the Arethusa/quadrige series by a ratio of better than three to one. The Kore/Nike with trophy series was evidently intended to meet much larger expenses, cover a longer period of time, or both.

For historical purposes there may be some advantage to a rough estimate of the absolute original size of the two issues. P. Kinns' study of Amphictyonic coinage suggests a theoretical output range of 23,333 to 47,250 coins per obverse stater die.²³ These figures are considerably higher than previously surmised. The Agathoclean tetradrachm dies, rather larger in size than the Amphictyonic staters, but of comparable relief, may be expected to be somewhat less prolific, but how much less is difficult to say. Kraay, on the basis of Sellwood's practical experiments, postulated a minimum of 10,000 coins per fourth-century Siculo-Punic tetradrachm die.²⁴ For the Attic New Style tetradrachms, which were often struck near the die limits, Kinns suggests "a figure in the region of 20,000" coins per obverse die may be appropriate. Using obverse die projections derived from the Carter formulas above, estimations of average die production, and assuming a talent of 6,000 drachmas, total values for the two tetradrachm series can be approximated.

²³ P. Kinns, "Amphictyonic Coinage Reconsidered," *NC* 1983, pp. 18–19.

²⁴ C. M. Kraay, "Greek Coinage and War," in W. Heckel and R. Sullivan, eds., *Ancient Coins of the Graeco-Roman World: The Nickle Numismatic Papers* (Waterloo, Ontario, 1984), p. 7, relying on D. G. Sellwood, "Some Experiments in Greek Minting Technique," *NC* 1963, pp. 217–31.

<i>Projected Die Total</i>	<i>Estimated Coins per Die</i>	<i>Total Value in Attic Talents</i>
Arethusa/quadriga		
16	10,000 (Kraay)	106.66
	15,000	160
	20,000 (Kinns, Attic)	213.33
	23,333 (Kinns, Amphict.)	248.88
	47,250 (Kinns, Amphict.)	504
Kore/Nike with trophy		
58	10,000 (Kraay)	386.66
	15,000	580
	20,000 (Kinns, Attic)	774.33
	23,333 (Kinns, Amphict.)	902.21
	47,250 (Kinns, Amphict.)	1827

The vastly higher production rates of the Amphictyonic estimates might be inapplicable here, but they can be said to rest on reasonable calculations of near-contemporary practice, and at the very least they suggest that Kraay's minimum estimate of 10,000 may be impractically low. Since die breaks on surviving coins of the Arethusa/quadriga series are rather rare, it appears that each die was not pushed to its maximum output. It therefore seems reasonable to posit an average production rate in the range of 15,000 coins per obverse die. This would give a very approximate total value for the Arethusa/quadriga series of 160 Attic talents.

Die breaks and flaws in the Kore/Nike with trophy series are not infrequent and they appear on both the fine and the barbarous styles, on both obverse and reverse. In the case of the barbarous dies such breaks may be due to their coarse execution rather than excessive use. The low survival rate of the barbarous style (many combinations are attested by only one or two coins) might indicate that the dies were poorly made as well as inartistically carved. On the other hand, this apparently low survival rate might be a result of selection. Because of their superior design and execution, coins of the fine style are more likely to be published with photographs than their barbarous counterparts. An average production of 15,000 coins per die, as with the Arethusa/quadriga series, gives a minimum total value of the Kore/Nike with trophy series in the neighborhood of 580 Attic talents.

CHRONOLOGICAL CONSIDERATIONS

Since Head's work on Syracusan coinage, it has been traditional to divide the coinage of Agathocles into three periods: 317–310 B.C. (from Agathocles' seizure of power until his invasion of Africa), 310–304 (from the invasion of Africa to the end of the war with Carthage and Agathocles' proclamation as king), and 304–289 (from Agathocles' proclamation as king until his death). These divisions, corresponding to political and military phases in Agathocles' reign, are largely based upon the historical narrative of Diodorus of Sicily.²⁵ In this tripartite scheme, the Arethusa/quadrige tetradrachms are usually assigned to phase 1, and the Kore/Nike with trophy tetradrachms to phase 2. Thus both silver issues are assigned to cover the costs of Agathocles' war with Carthage.

In light of recent archaeological evidence, Jenkins has endeavored to revise and refine the traditional chronology. He notes that the hoard found in 1957 at Pachino in southeast Sicily contained a very full sample of Corinthian pegasi of Ravel period V down to the occupation of Corinth by Ptolemy I in 308–306 along with 16 Arethusa/quadrige tetradrachms but no Kore/Nike with trophy tetradrachms. Jenkins concludes that the Kore/Nike with trophy and Agathocles' name must not yet have been struck when the Pachino hoard was closed, not too long after 308, concluding that "these have been dated 310–305 B.C., but in view of the evidence of the Pachino hoard they are unlikely to have started so soon. If they had not started by 310 when Agathocles led his expedition to Africa, they are unlikely to have begun until 306 or 305 after the African campaign."²⁶

²⁵ Head, *Syracuse* (above, n. 2), pp. 40–52, and *HN*, p. 181, followed by Buda (above, n. 2), pp. 194 and 200. Although Diodorus (20.54.1) erroneously dates Agathocles' proclamation as king to 308/7, his observation that Agathocles took the royal title in imitation of the Diadochoi establishes a terminus post quem of early 304 B.C. On the chronology of royal claims by Ptolemy and Seleucus, see E. S. Gruen, "The Coronation of the Diadochoi," in J. W. Eadie and J. Ober, eds., *The Craft of the Ancient Historian: Essays in Honor of Chester G. Starr* (Lanham, Maryland, 1985), pp. 258–59.

²⁶ Jenkins (above, n. 2), pp. 151–52; Pachino 1957 hoard, *IGCH* 2151.

Jenkins therefore proposes a four-phase chronology for Agathocles' coinage. Phase 1 includes the full-weight silver Pegasi (Plate 1, 6), along with the Apollo/biga gold drachm (Plate 1, 5) and its fractions. Phase 2 contains the Arethusa/quadrige tetradrachms, the Apollo/Pegasus and Persephone/bull bronzes (Plate 1, 13), and most, if not all, of the electrum (Plate 1, 14). This phase, or at least the Arethusa/quadrige tetradrachms in it, "probably continued until ca. 306–305." The boundary between phases 1 and 2 is not specified, but it may be the traditional terminus of ca. 310. Phase 3, containing the Kore/Nike with trophy tetradrachms and the rare gold stater, extends from ca. 305 to ca. 295 B.C. The gold (Plate 1, 11) and bronze (Plate 1, 12) coins bearing the reverse legend ΑΓΑΘΟΚΛΕΟΣ ΒΑΣΙΛΕΟΣ, and the reduced-weight silver pegasi (Plate 1, 7), comprise phase 4, which covers the period ca. 295–289 B.C.

Jenkins' view of Agathoclean tetradrachm chronology has been extremely influential. The Pachino 1957 hoard creates a strong presumption that the bulk of the Kore/Nike with trophy series was struck after ca. 308 B.C. Yet this conclusion may not be as firm as is sometimes supposed. Silver tetradrachms make up less than 6 percent of the hoard contents (42 of 642 pieces), and the Agathoclean examples make up only 38 percent of the silver tetradrachms (16 of 42). The content of the hoard is neither representative of Siculo-Punic tetradrachms to 308, nor of non-Syracusan Sicilian tetradrachms.²⁷ Thus even if the Pachino 1957 hoard is to be dated ca. 305/300, the absence of Kore/Nike with trophy tetradrachms might be fortuitous.

²⁷ The Pachino 1957 hoard contains none of the Siculo-Punic tetradrachms of the type Tanit/horse's head and palm, found in the S. E. Sicily 1977 hoard of ca. 300 B.C. (M. J. Price, *Coin Hoards 6* [London, 1981], 21). Siculo-Punic tetradrachms (15 examples) and Syracusan tetradrachms (16 examples) are about equally represented in the Pachino 1957 hoard. The hoard also contains no tetradrachms from Rhegion, as in the Gela 1977 hoard (M. J. Price, *Coin Hoards 5* [London, 1979], 28), dated ca. 310, or from Selinus or Camarina, as in the Sila, Calabria 1950 hoard (M. J. Price, *Coin Hoards 4* [London, 1978], 30), dated to ca. 300. The Siculo-Punic tetradrachms are discussed by G. K. Jenkins, "Coins of Punic Sicily," *SNR* 50 (1971), pp. 25–78; 53 (1974), pp. 23–41 (series 1); 56 (1977), pp. 5–65 (series 2–4); and 57 (1978), pp. 5–68 (series 5–6).

To numismatists of Sicily it will seem captious to fault the hoard evidence, for the period of Agathocles is perhaps as well served as any in the island's history. A survey of the 16 hoards containing Agathoclean tetradrachms appears in Chart 3 below. It is readily apparent that the Kore/Nike with trophy series roughly parallels the Siculo-Punic tetradrachms of Jenkins series 5, the Heracles-Melqart/horse's head and palm. Yet this does not necessarily give us an absolute date, since Jenkins' estimate of series 5 (ca. 306–289) is in turn based upon the belief that the Kore/Nike with trophy series did not begin until ca. 305. The date for the Pachino 1957 hoard depends upon its Corinthian Pegasi. The latest coins are Corinthian Pegasi of Ravel's period V, down through the **AY** group but not including the **ΔO** group of the Ptolemaic occupation.²⁸ At present we do not know when the **AY** group began, and how much time, if any, came between the end of **AY** and the beginning of **ΔO**. The groups of period V are too few to represent annual units of continuous production, and more likely than not gaps of several years separated the groups. Jenkins' date of ca. 305/300 for Pachino 1857 presupposes the **AY** group could not have begun any earlier than ca. 310. If any part of the **AY** group was struck before ca. 310, then even the evidence of the Corinthian Pegasi would be consistent with a date of ca. 310 for the Pachino 1957 hoard as a whole. Since the Corinthian coins were struck at least in part for use in Sicily, the time between striking and deposition in a Sicilian hoard need not have been long.

Moreover, Jenkins' chronology requires Agathocles to pay the cost of the long and exhausting war with Carthage primarily with the Apollo/biga gold drachms, the full-weight pegasi, and the Arethusa/quadrige tetradrachms. (The electrum issues are to be dated to the period immediately following the peace with Carthage, see below, pp. 33–37.) Without a detailed study of the gold and Pegasi issues, we cannot exclude the possibility that their volumes were substan-

²⁸ G. K. Jenkins, "A Note on Corinthian Coins in the West," in H. Ingholt, ed., *Centennial Publication of the American Numismatic Society* (New York, 1958), pp. 367–79. I have profited from conversations with L. L. Brice concerning Corinth period V Pegasi.

CHART 3. HOARDS

Hoard Date	CH 5, 28 310 B.C. Near Gela 1977	CH 4, 30 300 Sila, Calabria 1950	CH 7, 58 300 Camarina 1976	IGCH 2150 ca. 300 Canicattini 1917
Syracuse				
<i>R</i> tetradrachms	11+	2	2	1
Arethusa/quadriga		2 fdc		1
Kore/Nike		—		—
<i>R</i> full-weight pegasi				
<i>R</i> reduced-weight pegasi				
Other Syracuse <i>R</i>	15+	1		
EL				
Late <i>A</i> stater				
Siculo-Punic				
<i>R</i> tetradrachms	3+		3	
Panormus (ziz)				
Jenkins 2				
Jenkins 3				
Jenkins 4				
Jenkins 5				
Raf-Melqart		1 fdc		
EL				
Greek Sicily				
Camarina		1		
Gela				
Léontinoi				
Messana				
Rhegion	2			
Selinus		2		
Pegasi				
Corinth	many			16
Elsewhere	many			2
Athens				
<i>R</i> tetradrachms	many		19	
Macedon				
Alexander III			27	
Philip III			1	

Hoard Date	IGCH 2151 ca. 300 Pachino 1957	IGCH 2154 ca. 300 Cefalu 1925	CH 6, 21 ca. 300 S.E. Sicily 1977	IGCH 2185 ca. 289 Camarina/Scoglitti 1928
Syracuse				
R tetradrachms	16	38	45+	10
Arethusa/quadriga	16	8	some	1
Kore/Nike	—	30	some	9
R full-weight pegasi				3
R reduced-weight pegasi				8
Other Syracuse R			48+	42
EL				2
Late <i>A</i> stater				
Siculo-Punic				
R tetradrachms	10	22		1
Panormus (ziz)			27	
Jenkins 2	1		11	
Jenkins 3	7	7	59	
Jenkins 4	2			
Jenkins 5		15	80	1
Rat-Melqart	5	6		34
EL				
Greek Sicily				
Camarina	1			1
Gela				
Leontinoi	1			1
Messana	1			1
Rhegion				
Selinus				
Pegasi				
Corinth	473		2,000	41+
Elsewhere	115		some	166+
Athens				
R tetradrachms	1		800	1
Macedon				
Alexander III	8	1	1,200	
Philip III	1			

Hoard Date	IGCH 2184 ca. 289 Mineo 1905	IGCH 2178 early 3rd Selinute 1876	IGCH 2179 early 3rd Syracuse/Fusco 1955	IGCH 2180 early 3rd Megara Hyblaea 1966
Syracuse				
R tetradrachms	19	1	3	9
Arethusa/quadriga	7	1	1	6
Kore/Nike	12		2	3
R full-weight pegasi			1	some
R reduced-weight pegasi				some
Other Syracuse R				
EL				
Late <i>A</i> stater				
Siculo-Punic				
R tetradrachms	28	28	2	32
Panormus (ziz)	4			
Jenkins 2	1			3
Jenkins 3	7	21	2	6
Jenkins 4				
Jenkins 5	16	7		23
Raf-Melqart		1		2
EL				
Greek Sicily				
Camarina				
Gela	1			1
Leontinoi				
Messana				
Rhegion				
Selinus				
Pegasi				
Corinth	1+		5+	ca. 286
Elsewhere			8	192
Athens				
R tetradrachms	4			2
Macedon				
Alexander III				
Philip III				2

Hoard Date	IGCH 2181 early 3rd Palazzolo Acraide 1896	IGCH 2182 early 3rd Cammerata 1859	IGCH 2186 early 3rd Pachino 1921	IGCH 2183 early 3rd Gela/Capo Soprano 1955?
Syracuse				
<i>R</i> tetradrachms	5	10+	some	4
Arethusa/quadriga	some	3		
Kore/Nike	some	7 fdc	some	4
<i>R</i> full-weight pegasi				1
<i>R</i> reduced-weight pegasi	some		70	
Other Syracuse <i>R</i>	some			
EL				
Late <i>A</i> stater			10+	
Siculo-Punic				
<i>R</i> tetradrachms	1	ca. 30	some	1
Panormus (ziz)				
Jenkins 2		1+		
Jenkins 3	1	7		1
Jenkins 4		2		
Jenkins 5		ca. 20		
Ras-Melqart		2		
EL			some	
Greek Sicily				
Camarina				
Gela				
Leontinoi				
Messana				4
Rhegion				
Selinus		1		
Pegasi				
Corinth	some	ca. 150		27
Elsewhere	some	some		51
Athens				
<i>R</i> tetradrachms				
Macedon				
Alexander III			some	1
Philip III				

tial.²⁹ We do know that the Arethusa/quadrige series, though respectable, represents at best only a fourth of total Agathoclean tetradrachm production.

There are only scattered notices of Agathocles' financial situation. His army at the outbreak of war with Carthage consisted of a mercenary force of 10,000 infantry and 3,500 cavalry, as well as unknown (but probably substantial) numbers of Syracusan citizens and allies (Diod. 19.72.2). The rate of pay for this mercenary force is also unknown, but can be conjectured at not less than three obols a day per foot soldier and a drachm a day per horseman.³⁰ Such a force, if paid regularly, would have cost Agathocles nearly a talent and a half per day, and over a minimal three month campaign season would have required 127.5 Attic talents.³¹ It is the scale, rather than the accuracy, of these figures that matters: either military expenditures were *considerably* less than 127.5 talents, or the total value of the Arethusa/quadrige series was *considerably* more than 160 talents, or both, if there is to be any reasonable possibility that the Arethusa/quadrige series sufficed until ca. 305 B.C.

Of course Agathocles, like most commanders of mercenaries, sometimes neglected to pay his men regularly (see the taunt of his enemies at Diod. 20.63.5). But he was usually careful to do so only when the soldiers were in no position to complain. It is unlikely that he attempted such economy any time before the battle of Himaras (311 B.C.), since there was always the danger that disaffected troops

²⁹ To my knowledge no study of the Apollo/biga drachms or the full-weight pegasi has been done. It must be borne in mind that Agathocles would also have been able to meet some of his early expenses out of existing coin. For instance, T. V. Buttrey, "The Morgantina Gold Hoard and the Coinage of Hicetas," *NC* 1973, pp. 4-5, suggests that the coins of Philip II and Alexander III found in a hoard at Morgantina in 1966 were what Agathocles paid mercenaries raised in that town in ca. 317.

³⁰ W. K. Pritchett, *The Greek State at War*, pt. 1 (Berkeley, 1971), pp. 14-29, although his figures are probably too low. Still of considerable value is G. T. Griffith, *The Mercenaries of the Hellenistic World* (Cambridge, 1935), pp. 294-307.

³¹ 10,000 infantry x 1/2 drachm per day	= 5,000 drachms per day
3,500 cavalry x 1 drachm per day	= 3,500 drachms per day
total mercenary force	= 8,500 drachms per day
8,500 drachms x 90 days = 765,000 drachms	= 127.5 Attic talents

might desert or join the Carthaginians or other opponents in Sicily. M. Thompson has argued that the pattern of Alexander's lifetime coinage supported the view that mercenaries were paid only at the end of their service.³² She noted that the heavy production at Amphipolis, Lampsacus, Side, and other Aegean area mints in the period ca. 325–323 B.C. might plausibly be linked to the discharge of substantial numbers of mercenaries who had been involved in Alexander's eastern campaigns. Since Alexander's circumstances were truly exceptional, however, we should not conclude that all mercenaries were usually paid only at the end of their period of service. Neither the historical sources (e.g., Diod. 20.63.5; 20.33.8) nor the distribution of silver coinage in the hoards suggests that Agathocles' soldiers expected to be paid only at the end of major campaigns.³³

Comparing Carthaginian expenses for the same period, Kraay has used Jenkins' study of Siculo-Punic coinage to argue that on average a year of warfare in the fourth century cost the Carthaginian state the product of about seven tetradrachm obverse dies.³⁴ If Syracusan annual war expenses were at all comparable to the Carthaginian, the 16 obverse dies of the Arethusa/quadrige series might be expected to last no more than two or three years. Jenkins' own calculations are

³² M. Thompson, "Paying the Mercenaries," in A. Houghton et al., eds., *Studies in Honor of Leo Mildenberg: Numismatics, Art History, Archaeology* (Wetteren, 1984), pp. 241–47.

³³ It is worth pointing out how uncharacteristic the peresumably deferred payments of 325–323 are even for Alexander's army. The number of Alexander's mercenaries remained relatively small until about 331 B.C. (A. B. Bosworth, *Conquest and Empire* [Cambridge, 1988], p. 266). Clearly the need to pay the mercenaries, and sooner rather than later, induced Alexander to keep their numbers small until the capture of the Persian treasuries made economy a minor consideration. Alexander's practice of detailing mercenary troops to satrapal armies and other ad hoc tasks makes it very unlikely that pay could have been long deferred.

³⁴ Kraay (above, n. 24), pp. 6–7. He supposes an average production rate of 10,000 coins per die (yielding a value of 45–50 talents), but both figures are probably conservative. These calculations represent the Carthaginian outlay in new coin alone, and there is no way to estimate the quantity of old coin, bullion, or taxes in kind that might have been included in the total cost to the Carthaginian government. Of course the same unknowns hold for Syracuse as well.

somewhat different. He counts 41 obverse dies in his Siculo-Punic tetradrachm series 3 and 4, covering the years ca. 320–ca. 305/300.³⁵ This is nearly three times as many obverse dies as in the Arethusa/quadrige series. Either the war cost the Carthaginians well over twice as much as it cost Syracuse, or part of the Syracusan war expenses must have been paid out of other funds. The Kore/Nike with trophy series is a logical source.

Jenkins' proposed chronology requires us to date the bulk of Agathocles' precious metal coinage after the war with Carthage and it also compels us to place after ca. 305 those Siculo-Punic silver tetradrachms (Heracles-Melqart/horse's head and palm tree series, Plate 1, 15) which Jenkins has made contemporary with the Agathoclean Kore/Nike with trophy series.³⁶ Jenkins found series 5 to contain 41 obverse and 74 reverse dies, so that it is about as large as either his series 2 (covering some 30 years, including the war with Timoleon) or series 3 (covering, on Jenkins' analysis, virtually the entire war with Agathocles). It is scarcely conceivable that all these Heracles-Melqart tetradrachms were struck only after ca. 308, since Carthaginian participation in the fighting in Sicily came to an end very shortly thereafter. No military activities in Sicily in the period after ca. 305 have been postulated to explain Carthaginian military spending on this order. On the contrary, the favorable terms and indemnity the Carthaginians granted Agathocles in 306/5 strongly suggest that they were unwilling to continue military expenditure at pre-306/5 levels.

The iconography of the Heracles-Melqart tetradrachms also implies a date early in the last decade of the fourth century. Agathocles' unexpected victory outside Carthage in autumn 310 B.C. produced much soul-searching in the city. The Carthaginians attributed their defeat to the anger of the gods in general and of Heracles-Melqart in particular, whose cult they had neglected. Diodorus, whose source is usually well informed on internal Carthaginian affairs, reports that the

³⁵ Jenkins, "Punic Sicily" 1977 (above, n. 27), pp. 32–33. This figure does not include the silver tetradrachms struck at the Siculo-Punic mints *RSMLQRT* and *ZIZ*; if they were devoted to military expenditures, the total Carthaginian outlay would have been still higher.

³⁶ This is series 5 in Jenkins' ordering, treated in detail in "Punic Sicily," 1978, pp. 5–68, and 1977, pp. 23–24. See also Jenkins (above, n. 2), p. 150.

Carthaginians, in order to propitiate the god, "sent a great sum of money and many of the most expensive dedications" (20.14.1) to the great temple of Melqart in Tyre. The appearance of Heracles-Melqart on Siculo-Punic tetradrachms might well illustrate this renewed attention to the god. Conversely, as Jenkins concedes, there is no "special reason why the Herakles-Melqart head should suddenly appear on Punic coins minted in Sicily around 300 B.C."³⁷ Thus on grounds of historical probability, both the Agathoclean Kore/Nike with trophy tetradrachms and the Siculo-Punic Heracles-Melqart/horse's head and palm tree tetradrachms should be dated to the early years of Agathocles' African campaign.

The Pachino 1957 hoard is not firm evidence for the belief that the Kore/Nike with trophy tetradrachms began only after ca. 308 B.C. The size of this series suggests it should be equated with a period of high mercenary expenses and, on the evidence of Diodorus, this should be somewhere in the period 313–305/4. Both estimates of Syracusan military expenditures and comparison with those of the Carthaginian suggest that the Arethusa/quadriga series is not likely to have been large enough to meet Agathocles, expenses until ca. 305. The traditional chronology, which placed the Kore/Nike with trophy tetradrachms and the companion gold stater in the early years of the African invasion, may indeed be valid. Agathocles' need for new coinage in the years after 306/5 B.C. will then have been met by continued minting of barbarous Nike tetradrachms, the electrum series, the reduced-weight pegasi, and the late gold pieces.

THE DATE OF THE SYRACUSAN ELECTRUM COINAGE

Thanks to the efforts of Jenkins, the electrum coins of Syracuse are perhaps the best studied segment of Agathoclean coinage. The use of electrum outside the Carthaginian controlled areas of Sicily, as elsewhere throughout the Greek world, is rare, and the Agathoclean electrum is perhaps best seen as an experiment without precedent or sequel in Syracusan coinage. Jenkins has divided the four main types and denominations into groups A-D on the basis of their gold content.

³⁷ Jenkins, "Punic Sicily" 1978 (above, n. 27), p. 10.

The differences in weight and metal quality between the groups suggest that they do not form a homogenous issue and, despite the many attested dies (31 obverse and 48 reverse), the total volume of the coinage seems not have been extensive or production long-lived.³⁸

Jenkins' attribution of the Syracusan electrum coinage to Agathocles is now widely accepted. Its exact position within Agathocles' reign is not as firmly established, and Jenkins' argument here depends in part on the chronology of Agathocles' bronze issues, which cannot be pressed too closely. Jenkins notes that the electrum shares many symbols with the long-lived Agathoclean Persephone/bull butting left bronze series. The bronze is linked by the control letters NI and NK to the Arethusa/quadriga tetradrachms. Jenkins therefore assigns at least group B, the largest segment of the electrum, to his phase 2 (ca. 310–ca. 305). Yet the electrum itself is not directly linked to the Arethusa/quadriga tetradrachms, which provide the chronological peg for this arrangement. As Holloway has shown, the bronzes of the Persephone/bull butting left type are extremely numerous and must have covered long periods of Agathocles' reign. Some are demonstrably early such as examples found at Gela in strata connected with repairs conducted by Agathocles in 311/10. Others share symbols with Agathoclean gold reduced-weight staters from the latest phase of his reign. Thus symbols are no impediment to dating the electrum coins as early as Jenkins' phase 2 and they do not necessarily preclude a later date. Substantial quantities of Syracusan (and Carthaginian group V) electrum were in the Camarina (Scoglitti) 1928 hoard, but on the basis of other contents this hoard is demonstrably late in Agathocles' reign, and it cannot date the Syracusan electrum more closely than "before ca. 289 B.C."³⁹ The absence of Syracusan electrum from earlier Agathoclean hoards (e.g., Pachino 1957) might

³⁸ Jenkins (above, n. 2), pp. 147–49 and the parenthetical remarks in G. K. Jenkins and R. B. Lewis, *Carthaginian Gold and Electrum Coins*, Royal Numismatic Society Special Publications 2 (London, 1963), pp. 32–34.

³⁹ Gela: Holloway (above, n. 2), pp. 88 (Capo Soprano) and 90 (Costa Zampogna). Gold reduced staters: Jenkins (above, n. 2), p. 152 and n. 2; compare the symbol Ε on the (presumably early) bronzes, *SNGANS* 611–12, with that on the (universally deemed late) gold, *SNGANS* 704. Camarina (Scoglitti) 1928 hoard: *IGCH* 2185.

imply a late date for the electrum, but it might just as easily reflect a preference for silver coin on the part of the hoard depositors.

Historical considerations in fact suggest that the beginning of the Syracusan electrum issues should be dated to the peace treaty between Agathocles and Carthage in 306/5. Diodorus says (20.79.5) that the Carthaginians, in exchange for a treaty with Agathocles, paid him "gold to the value of three hundred talents of silver, or as Timaeus says, one hundred and fifty, and 200,000 medimnoi of grain." The explicit mention of gold here is significant and ought not to have gone unremarked. Agathocles had recently abandoned his African army, partly to avoid paying it. His credit as an employer must then have been particularly low, and his need for cash quite pressing, if he was to have any hope of continuing the struggle with his Greek opponents in Sicily. Hence the Carthaginian indemnity, in whatever form, cannot have long remained unminted.

Which Agathoclean gold issue can be most reasonably dated to 306/5? The Apollo/biga drachms are too early, given the hoard evidence. The gold staters of Ptolemaic type were apparently never very numerous, given their survival rate, and there may never have been more than one obverse and one (reworked) reverse die. They can hardly have accounted for 150–300 silver talents' worth of gold. The helmeted Athena/thunderbolt gold pieces with the reverse legend ΑΓΑΘΟΚΛΕΟΣ ΒΑΣΙΛΕΟΣ are somewhat more plentiful, but they appear in hoards only towards the end of Agathocles' reign, and are therefore traditionally dated fairly late.⁴⁰ The only sizable Agathoclean gold issue that can be credibly dated to 306/5 is the electrum.

The Carthaginians perhaps paid the indemnity in bullion, as they did on other occasions. But it is worth considering the possibility that they paid in Carthaginian electrum coin. This might account for Diodorus's reckoning the gold in terms of silver value, or the different estimates of its value in his sources. Since Diodorus never uses ἤλεκτρον except to mean amber, we would expect electrum to appear in his text as χρυσίον. The hypothesis of Carthaginian payment in electrum

⁴⁰ Jenkins (above, n. 2), pp. 151–52; he counts only six obverse and seven reverse dies in 18 combinations. The royal title in the legend suggests that they cannot have been struck before spring 304 at the earliest.

would help to explain the unprecedented use of that metal at Syracuse. We might suppose that Agathocles found it easier and quicker to reissue the Carthaginian electrum as Syracusan, rather than to render it into its constituent metals. Rather than a gold issue debased by wartime exigencies, the Syracusan electrum would thus become the first of Agathocles' post-war issues, intended to circulate side-by-side with Carthaginian electrum, as indeed the hoards suggest.⁴¹ If this hypothesis is true, it may even provide an absolute date for the Carthaginian series, since the gold content of the main Syracusan electrum, group B, (52–55%) corresponds closely to proportions of Carthaginian group V (57–59%).

One difficulty with dating the electrum coinage to 306/5 is the relative restraint of its legend **ΣΥΠΑΚΟΣΙΩΝ**: one might expect a more explicit announcement of Agathocles' position. The evidence of the bronze coins, however, suggests caution in matters of legend. The Artemis **ΣΩΤΕΙΡΑ**/thunderbolt coins are the only bronze issues to bear Agathocles' name and title. Holloway has shown that these bronzes are superseded well before the end of Agathocles' reign by the Heracles/lion and club bronzes bearing the legend **ΣΥΠΑΚΟΣΙΩΝ**.⁴² Holloway's conjecture that Agathocles must have made some show of abdication well before his death seems historically improbable, but it does show that the problem of the occasionally surprising **ΣΥΠΑΚΟΣΙΩΝ** legend cannot be avoided. Agathocles' reduced-weight pegasi, universally dated to the period after 305, bear no legend whatsoever. Thus the appearance of **ΣΥΠΑΚΟΣΙΩΝ** on the electrum issues need not require a date earlier than 306/5. Perhaps Agathocles' peculiar position at the end of the Carthaginian war contributed to conservative legend choice. For the first time since 316, Agathocles faced substantial military opposition from Syracusans under the leadership of Deinocrates. To triumph over this opposition required political accommodation as well as superior generalship, and Agathocles rose

⁴¹ Those hoards containing the Syracusan electrum frequently contain Carthaginian as well: Camarina (Scoglitti) 1928 (*IGCH* 2185); Pazzano, Calabria 1952 (*IGCH* 1945); and Ragusa 1905 (*IGCH* 2176). This suggests that the two varieties did not circulate in separate zones controlled by warring powers, and thus favors a date of ca. 305 rather than ca. 310.

⁴² Holloway (above, n. 2), pp. 91–92.

to the challenge. One possibility is that the traditional legend represented a concession to Syracusan sensibilities which had not been necessary in the heady days of the African campaign. Alternatively, the more traditional legend might be viewed as a measure to increase the acceptability of the novel electrum coinage to the Syracusan and wider Sicilian public.

The die studies presented have shown the relative sizes of Agathocles' two tetradrachm issues and permitted approximate estimates of their absolute sizes as well. The Arethusa/quadrige series, consisting of two roughly equal and distinct groups identifiable by monograms on the obverses, probably never numbered substantially more than 16 or 17 obverse dies. The total size of this series is therefore probably less than half that of the major fourth century Siculo-Punic tetradrachm issues (about 38 obverse dies) and less than one-third the size of the highly varied Kore/Nike with trophy series (about 58 obverse dies). The traditional division of this latter series into fine and barbarous styles has been largely confirmed by this inquiry. There are numerous groups within both styles, but their relation to one another is not always clear and the sequence of groups within the fine style at least seems to be quite contrary to previous scholarly opinion.

Volume calculations for the Agathoclean tetradrachm series and estimates of Agathocles' military expenditures during the war with Carthage combine to raise serious doubts about the chronology of Agathoclean coinage proposed by Jenkins. More exact conclusions concerning the dates and duration of the tetradrachm series will require a detailed study of the early Agathoclean gold drachms and silver pegasi, but the conclusions drawn here tend to favor the older chronology of Head. The Arethusa/quadrige series began in the early years of Agathocles' reign (before ca. 310), and probably lasted only two or three years. It is highly unlikely that it was the only tetradrachm series in circulation as late as ca. 305 B.C. The beginning of the Kore/Nike with trophy series should probably be assigned to the early years of Agathocles' African invasion (310–308), rather than after ca. 305, as Jenkins proposed. This may mean that Jenkins' series 5 of the Siculo-Punic tetradrachms should likewise begin earlier in the last decade of the fourth century B.C. An early date for both

these series implies that the Pachino 1957 hoard, so crucial for our understanding of Sicilian early Hellenistic chronology, should be dated to ca. 310 B.C., some five to ten years earlier than Jenkins proposed. On the basis of Diodorus' narrative, a new date, 306/5, is proposed for the Syracusan electrum series.

If the chronology offered above is accurate, a number of consequences follow. First, the absence of Agathocles' royal title on the Kore/Nike with trophy tetradrachms and the exactly contemporary gold stater becomes more intelligible: all of the gold, and substantial portions of the silver were already struck before Agathocles proclaimed himself king. Secondly, the Seleucid tetradrachm reverse clearly modeled on the Agathoclean Nike with trophy reverse (Plate 1, 16) may be redated without undue constriction to ca. 305–301 B.C., as has already been suggested by A. Houghton on other grounds.⁴³ Dating the bulk of Agathocles' military expenses earlier than Jenkins suggested may have some consequences for our understanding of Agathocles' Italian campaigns in the years after 304. The reduced-weight silver pegasi and reduced-weight gold staters will have constituted most of the new coinage for these military operations. If this is so, and if these coinages were not large, Agathocles' military activities from 305/4 to 289 might have been as limited in extent and duration as the fragmentary surviving literary accounts suggest.

CATALOGUE

The coins are numbered by die combination, obverse die, and reverse die. Weights have been chosen from the most recent and reliable sources and grains have been converted to grams and rounded to two decimal places. Some comparative material is illustrated, followed by selected obverses and then the reverses. A dagger (†) indicates an illustrated obverse die, an asterisk (*) an illustrated reverse die. A Key to Plate 1 and an abbreviations list of collections, publications, and sale catalogues follow the catalogue.

⁴³ A. Houghton, "Notes on the Early Seleucid Victory Coinage of 'Persepolis,'" *SNR* 59 (1980), pp. 5–14.

ARETHUSA/QUADRIGA SERIES

Obv. Head of Arethusa l., with necklace, earrings, and wreath, surrounded by three dolphins; below neck, \aleph (O 1, 2), NI (O 3–7), NK (O 8–9).

Rev. Quadriga l., charioteer in chiton, reins in l., kentran in r., triskeles above; $\Sigma\text{Υ}\text{Π}\text{Α}\text{Κ}\text{Ο}\Sigma\text{Ι}\text{Ω}\text{Ν}$ and \aleph in exergue.

C O R

N, combinations 1–52.

- | | | | |
|---|---|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | 1 | 1 | a) *SNG <i>Lloyd</i> 1476, 16.91 g ↑; b) SNG <i>Lewis</i> 378, 16.84 ←; c) <i>Gulbenkian</i> 329, 16.89 g ↙; d) Vinchon, 20–22 May 1959, 416 = Bourgey, 5 May 1913, 28, 16.60 g; e) Stack's, 9 Nov. 1946, 137 |
| 2 | 1 | 2 | a) SNG <i>Cop</i> 753, 17.00 g ↑; b) Münz. u. Med., 5 Dec. 1968, 147, 16.99 g; c) Glendining, 31 Jan. 1951, 84, 16.93 g ↑ = Woodward 142; d) Schlessinger 13, 4 Feb. 1935, 376, 17.0 g; e) Baranowsky FPL, 1934, 4719 = Naville 4, 17–19 June 1922 (Michailovitch-Evans), 392, 16.59 g; f) Cahn 60, 2 July 1928 ("Num. in Kleinasien"), 233, 15.85 g; g) Ciani, 18 Dec. 1924 (Barrachin), 170 = Bourgey, 7 June 1909, 168, 16.3 g |
| 3 | 1 | 3 | a) † *SNG <i>ANS</i> 632, 17.135 g ↙; b) Sotheby, 23 July 1975, 7; c) Hess-Leu 28, 5–6 May 1965, 98, 17.11 g ↘; d) Kricheldorf 7, 12–13 Nov. 1959, 39, 13.45 g; e) Ciani-Vinchon, 6–8 Feb. 1956 (Hindamian), 264 = Hirsch 33, 17 Nov. 1913, 504, 17.08 g; f) Kelly, 25–29 Aug. 1950, 920 = Hirsch 13, 15 May 1905 (Rhosopoulos), 457, 16.91 g; g) Morgenthau 348, 9 May 1935, 151; h) Sambon-Canessa, 19 Dec. 1907 (de Ciccio), 401, 16.40 g |
| 4 | 1 | 4 | a) Glendining, 2 Feb. 1977, 256; b) Sotheby, 9–10 Mar. 1936 (Mavrojani), 121, 16.40 g; c) *McSorley FPL, [1968], 70 |

- 5 2 1 a) *SNGAshm* 2064, 16.86 g ↙; b) Vinchon, 25 Apr. 1966, 200; c) Sambon, 22 June 1906, 238
- 6 2 2 a) Münz. u. Med., 30 Nov.-1 Dec. 1972, 427, 16.97 g; b) *Sotheby, 15 June 1896 (Bunbury I), 472, 16.97 g
- 7 2 3 a) Hirsch 32, 14 Nov. 1912, 374, 17.00 g; b) Sambon-Canessa, 19 Dec. 1907 (de Ciccio), 399, 17.32 g
- 8 2 4 a) Seaby FPL 838, Mar. 1989, B8
- 9 2 5 a) † **SNGANS* 637, 17.04 g ↙; b) *SNGFitz* 1327, 16.97 g ↗ = Sotheby, 3 Feb. 1909 (Benson), 363; c) *MFA* 458, 17.14 g; d) Kovacs, 22 Apr. 1988 (ANS duplicates), 39, 16.72 g; e) Ratto FPL, Sept. 1922, 919, 16.40 g; f) Helbing, 12 Dec. 1904, 55
- 10 2 6 a) **SNGLloyd* 1477, 16.71 g ↘; b) *SNGDreer* 511, 16.92 g; c) *MFA* 459, 16.94 = Warren 401
- 11 2 7 a) Leu 15, 4-5 May 1976, 128, 17.36 g ↘ = Vinchon, 7 Nov. 1966, 22 = Vinchon, 6-7 Apr. 1959, 27
- 12 2 8 a) Ciani-Vinchon, 6-8 Feb. 1956 (Hindamian), 258, 16.46 g = Feuardent, 17 Dec. 1919 (Collignon), 118; b) *Santamaria, 6 Apr. 1908 (Stiavelli), 210, 16.8 g; c) Sotheby, 24 Apr. 1907 (Delbeke), 67, 16.98 g
- 13 2 9 a) Kricheldorf 17, 8 May 1967, 47
- 14 2 10 a) *SNGFitz* 1328, 17.14 g ↙ = Hess, 6 Jan. 1926 (Löbbecke), 114 = Rosenberg, 9 Mar. 1914, 44 = Egger, 10 Dec. 1906, 217 b) Superior, 30 Mar.-3 Apr. 1971, 168 = Malter FPL 26, Fall-Winter 1970/71, 8, 17.09 g; c) Naville 13, 27 June 1928 (Allatini et al.), 354, 17.04 g = Hirsch 14, 27 Nov. 1905, 226; d) Hamburger, 29 May 1929, 150, 15.89 g; e) *de Luyne*s 1318, 17.20 g
- 15 3 7 a) † *Florange, 28 May 1924, 9, 17 g
- 16 3 8 a) Hess 208, 14 Dec. 1931, 123, 17.16 g
- 17 3 9 a) *McCLean* 2818, 16.72 g ↗ = Sotheby, 8 Mar. 1892 (Tighe), 2; b) Hess-Leu 11, 24 Mar. 1959, 103,

- 17.14 g ↘; c) Naville 16, 3 July 1933, 837, 17.13 g = Naville 6, 18 Jan. 1924 (Bement), 534; d) Hamburger 98, 3 Apr. 1933, 417, 16.85 g; e) Feuardent, 16–18 June 1924, 48; f) Dupriez 112, 7 Apr. 1913, 128
- 18** 3 10 a) Stack's, 19–20 June 1969 (Fowler), 61, 16.12 g; b) *Hess-Leu 15, 7 Apr. 1960, 96, 17.22 g ↗ = *Jameson* 861 = Sotheby, 5 June 1905 (H. P. Smith), 122; c) Naville 15, 2 July 1930, 403, 16.79 g; d) Sotheby, 1 Dec. 1924, 36, 16.65 g; e) Hirsch 20, 13 Nov. 1907 (Hoskier), 183, 17.20 g
- 19** 3 11 a) Sotheby, Zurich, 4–5 Apr. 1973 (Ward), 257, 17.12 g = *Ward* 316; b) Schlessinger 13, 4 Feb. 1935, 377, 17.2 g; c) Sotheby, 13 June 1911 (Sandeman), 71, 17.23 g; d) Sotheby, 3 July 1911 (Butler), 87; e) Sotheby, 16 Nov. 1897 (Montagu II), 83, 17.24 g
- 20** 3 12 a) Pachino 15
- 21** 3 13 a) Harvard 1976.79-3694 (Ramage 118), 17.05 g ↘
- 22** 4 7 a) Helbing, 24 Oct. 1927, 2697, 17.2 g = Naville 5, 18 June 1923 (BM duplicates), 1175 = Santamaria, 7 Mar. 1910 (Hartwig), 649; b) Delaune, 3 Nov. 1920, 1
- 23** 4 8 a) *SNGSwed* 551, 16.20 g ↘; b) Münz. u. Med. 41, 18–19 June 1970, 34, 17.25 g ↑ = Hess-Leu 31, 6–7 Dec. 1966, 154 = Platt, 26–27 Mar. 1922 (Luneau), 278 = Nanteuil 380; c) Platt, 18 Nov. 1935 (Bougon), 32, 17 g
- 24** 4 9 a) † **SNGANS* 633, 16.97 g ←; b) Basel 4, 1 Oct. 1935, 535, 17.13 g
- 25** 4 10 a) *SNGANS* 635, 16.35 g →
- 26** 4 11 a) **Dewing* 943, 17.22 g ↘; b) Münz. u. Med., Sept.–Oct. 1976, 65, 17.09 g; c) Sambon-Canessa, 27 June 1927, 1024; d) Naville 5, 18 June 1923 (BM duplicates), 1174, 16.76 g
- 27** 4 12 a) Vinchon, 3–4 Mar. 1975, 14, 17.21 g = Bourgey, 14

May 1914, 36 = Bourgey, 23 May 1910, 44; b) Ciani-Vinchon, 6–8 Feb. 1956 (Hindamian), 261, 16.27 g = Feuardent, Dec. 1922 (Haviland), 61; c) Schlessinger 13, 4 Feb. 1935, 374, 16.5 g; d) Helbing, 20 Mar. 1928, 116, 17.1 g; e) *Hess, 18 Mar. 1918, 238, 17.07 g; f) Hirsch 20, 13 Nov. 1907 (Hoskier), 184, 17.07 g

- 28 4 13 a) *SNGANS 634, 17.02 g →; b) SNGAshm 2067, 16.94 g ↓; c) Glendining, 3–4 Oct. 1973, 7; d) Ciani-Vinchon, 6–8 Feb. 1956 (Hindamian), 260, 17.18 g; e) Schulman, 31 May 1938, 100, 17.18 g; f) Ciani, 20 Feb. 1935 (Grandprey), 80, 17.20 g = Feuardent, 11–14 June 1913 (Burel), 97; g) Naville 17, 3 Oct. 1934 (Burrage et al.), 273, 16.77 g; h) Hess, 18 Dec. 1933, 27; i) Naville 16, 3 July 1933, 836, 17.13 g = Naville 13, 27 June 1928 (Allatini et al.), 355; j) Hess 202, 28 Oct. 1930, 2331, 17.15 g; k) Helbing, 31 Jan. 1930, 143, 17.1 g; l) Sotheby, 21 Feb. 1929 (Pritchard), 28, 17.17 g; m) Schulman, 12 June 1928, 660, 16.92 g; n) *Locker Lampson* 104, 16.98 g; o) Sotheby, 29 Oct. 1917, 50, 17.17 g; p) Sambon, 18 Nov. 1907 (Nervegra), 780; q) Sotheby, 28 May 1900 (Late Collector), 157, 17.24 g
- 29 4 15 a) Leu FPL, Dec. 1970 (“Hippikon”), 41, 17.06 g / = Hess-Leu 9, 2 Apr. 1958, 103 = *Morgan* 150 = Sangiorgi, 15 Apr. 1907 (Strozzi), 1410; b) Ratto, 9 Oct. 1934, 74, 16.62 g; c) Naville 16, 3 July 1933, 840, 16.64 g
- 30 5 14 a) † *SNGAshm 2066, 17.02 g ↓
- 31 6 15 a) *BM 1918–2–4 79, 16.46 g; b) Basel 4, 1 Oct. 1935, 534, 16.43 g = Cahn 75, 30 May 1932, 211; c) Hirsch 19, 11 Nov. 1907, 270, 16.75 g
- 32 6 16 a) Stack’s 22, 3 Nov. 1965, 1014; b) Coin Galleries FPL 2/3, 1961, A560 = Coin Galleries, 18 Nov. 1960, 14 = Hess 207, 1 Dec. 1931, 191, 15.61 g; c) Santa-

maria, 25 Oct. 1951, A365, 16.85 g; d) Naville 16, 3 July 1933, 839, 16.31 g; e) Sambon-Canessa, 27 June 1927, 1026, 17.20 g; f) Hirsch 33, 17 Nov. 1913, 507, 17.00 g; g) *Schulman, 21 Oct. 1912, 24; h) Caprotti, 1 Mar. 1910, 432, 16.90 g

- 33** 6 17 a) † *SNGANS* 638, 16.33 g ↘; b) *SNGFitz* 1331, 16.89 g ↗; c) *SNGDavis* 81, 17.00 g ↖; d) NFA FPL 38, 1990, 14, 17.15 g; e) Glendining, 1 Mar. 1978, 20; f) Malloy FPL 27, Apr.-May 1972, 321 = Malloy FPL 22, May 1971, 364; g) Ciani-Vinchon; 6–8 Feb. 1956 (Hindamian), 259, 16.87 g = Hirsch 33, 17 Nov. 1913, 506; h) Glendining, 24 Nov. 1950, 1528, 16.95 g; i) Naville 16, 3 July 1933, 841, 16.58 g; j) Naville 10, 15 June 1925, 328, 17.07 g; k) *de Luynes* 1317, 17.20 g; l) Head, *Greeks*, Plate 31, # 12 = *Head, *Ancients*, Plate 35, # 28, 17.24 g
- 34** 6 24 a) **SNGLloyd* 1479, 16.98 g →; b) Peus 288, 30 Sept.-3 Oct. 1975, 104, 16.83 g; c) Schulman 248, 19 Nov. 1968, 63, 17.145 g; d) NFA, 18 Nov. 1947, 1310 = NFA, 25 Mar. 1947, 1022; e) Hamburger 98, 3 Apr. 1933, 416, 16.59 g; f) Naville 10, 15 June 1925, 329, 16.62 g = Naville 1, 4 Apr. 1921 (Pozzi), 641
- 35** 7 18 a) *SNGDelepierre* 702, 17.09 g ↘; b) *MFA* 460, 16.98 g = *Warren* 402; c) SB Zurich FPL, Winter 1975, 124, 16.96 g; d) Helbing, 20 Mar. 1928, 117, 16.35 g = *Hess, 18 Mar. 1918, 237 = Schulman, 5 May 1913, 2353; e) Ciani, 1 June 1920 (Monsieur B.), 36
- 36** 7 19 a) Coin Galleries FPL 20, Sept.-Oct. 1959, A629, 17.06 g; b) *Santamaria, 24 Jan. 1938, A118, 17.46 g = Santamaria FPL, July 1934, A94
- 37** 7 20 a) *Hirsch* 660, 17.06 g ↑; b) *Serrure, 30 Mar. 1914, 28, 17.3 g
- 38** 7 21 a) *Santamaria, 12–13 Oct. 1949, 398, 16.60 g; b)

- Naville 4, 17–19 June 1922 (Michailovitch-Evans), 393, 15.70 g
- 39** 7 22 a) Stack's, 10–11 June 1970, 147, 17 g; b) Helbing, 12 Apr. 1927, 1640, 17.30 g = Helbing, 22 Mar. 1926, 56
- 40** 7 23 a) † *SNGANS 639, 16.41 g \; b) Sternberg 10, 25–26 Nov. 1980, 26, 16.87 g; c) Münz. u. Med., 19–20 June 1975, 93, 17.07 g; d) Münz. u. Med. FPL 342, Feb. 1973, 17, 16.84 g; e) Leu FPL, Sept. 1962 ("Sicilia"), 124, 17.15 g; f) Naville 13, 27 June 1928 (Allatini et al.), 356, 16.84 g; g) Sotheby, 1 May 1929, 28
- 41** 8 22 a) SNGFitz 1329, 16.77 g ↓; b) SNGDelepierre 701, 16.92 g ^ = Florange, 23 Oct. 1933 (Franco), 16; c) Glendining, 25–28 Oct. 1955, 906 = SNGLockett 1002, 16.85 g ^; d) Schulman, 31 May 1938, 99, 16.95 g = *Helbing FPL 17, [1934], 157; e) Sambon-Canessa, 27 June 1927, 1025, 16.35 g; f) Naville 10, 15 June 1925, 327, 17.08 g = Weber 1668 = Hoffmann, 16 Jan. 1882 (Bompois), 497; g) Riechmann 30, 11 Dec. 1924 (Berlin duplicates), 326, 16.93 g; h) Mollthein 586, 17.28 g
- 42** 8 23 a) Bourgey, 6–7 Dec. 1961 (Coppens), 1; b) Naville 14, 2 July 1929 (Spencer Churchill), 139, 17.20 g = Naville 12, 18 Oct. 1926 (Bissen et al.), 987
- 43** 8 24 a) Coin Galleries, 17 Aug. 1956, 1307
- 44** 8 25 a) ANA, 24 Aug. 1976, 1516, 17.07 g; b) Glendining, 21 June 1972, 99, 16.96 g; c) Münz. u. Med. FPL 309, Feb. 1970, 2, 16.81 g; d) Schulman, H., 18–20 Nov. 1965, 501, 17.08 g = Christensen, 9 July 1965 (Parsons), 23; e) † *Hess-Leu, 12–13 Apr. 1962, 113, 17.10 g \; f) Coin Galleries, 20 Apr. 1961, 77, 17.12 g = Coin Galleries FPL 4, Sept.-Oct. 1960, A455
- 45** 8 26 a) SNGSalting 9, 17.44 g ↓; b) SNGManchester 495, 16.26 g ^ = Sotheby, 20 Dec. 1920 (Peterson), 64; c)

SNGCop 754, 16.45 g ↓; d) *SNGDelepierre* 700, 17.10 g ↑ = Florange, 20 May 1933, 17; e) Sotheby, 7 May 1975, 64, 17.13 g; f) Santamaria, 7 Oct. 1959, 43, 17.27 g; g) Coin Galleries FPL 20, Sept.-Oct. 1959, A630, 17.08 g; h) ANA, 16-21 Aug. 1952, 1182, 16.8 g; i) Cahn 80, 27 Feb. 1933, 106, 17.30 g = Cahn 71, 14 Oct. 1931, 192; j) Hamburger, 29 May 1929, 153, 16.95 g; k) *Neville 12, 18 Nov. 1926 (Bissen et al.), 988, 17.13 g; l) Sotheby, 23 May 1894 (Carfrae), 2, 17.43 g

46 8 27 a) *SNGAshm* 2065, 17.24 g ↘; b) *SNGFabricius* 256, 16.97 g ↓; c) *Stanford inv. 70.381; d) Münz. u. Med. FPL 253, Apr. 1965, 19, 16.61 g; e) Coin Galleries FPL 5/6, Nov.-Dec. 1960, A620, 17.12 g; f) *Hirsch* 661, 16.99 g ↑; g) Ciani-Vinchon, 6-8 Feb. 1956 (Hindamian), 262, 16.95 g = *Hirsch* 33, 17 Nov. 1913, 505; h) Helbing 70, 9 Dec. 1932, 527, 17.2 g; i) Cahn 71, 14 Oct. 1931, 193, 17.32 g; j) Glendining; 9 Mar. 1931, 978, 17.20 g = Neville 15, 2 July 1930, 404; k) Bourgey, 27 Mar. 1912, 139

47 9 24 a) Glendining, 25 Nov. 1953, 53; b) Baranowsky FPL, 1934, 4718 = Santamaria, 21 Nov. 1932, A59

48 9 26 a) *SNG Lloyd* 1478, 17.11 g ↘; b) *SNGSwed* 550, 16.45 g ← = Neville 10, 15 June 1925, 330; c) Bourgey, 20-21 Mar. 1975, 14, 17.18 g; d) *NCirc.* 6, June 1972, 6151, 17.17 g = Rosenberg 72, 11 July 1932, 209 = Hess 202, 28 Oct. 1930, 2330 = Cahn 66, 9 May 1930, 139; e) Stack's, 10-11 June 1970, 146, 17.14 g; f) Leu FPL, Sept. 1962 ("Sicilia"), 123, 17.13 g = Neville 16, 3 July 1933, 838 = Neville 14, 2 July 1929 (Spencer Churchill et al.), 140 = Neville 5, 18 June 1923 (BM duplicates), 1176 = Sotheby, 19 Jan. 1914 (Cumberland Clark), 110; g) Hamburger, 11 June 1930, 639, 16.68 g; h) Ratto, 24 June 1929 (Rogers), 193, 17.15 g = Canessa 5, 12 June 1928 (Polese), 653

- 49 9 27 a) *SNGFitz* 1330, 17.26 g \ = Sotheby, 3 Feb. 1909 (Benson), 362
- 50 9 28 a) *SNGManchester* 496, 17.30 g \; b) Syracuse 38150, 17.04 g ^; c) Vinchon, 2–3 Dec. 1975, 27, 17.04 g; d) Vinchon, 24 Nov. 1969, 106, 17.12 g; e) Glendining, 17–18 May 1967, 22; f) *Santamaria, 4 May 1961, A97, 17.14 g; g) Ciani-Vinchon, 6–8 Feb. 1956 (Hindamian), 263, 17.05 g = Hirsch 32, 14 Nov. 1912, 375; h) Cahn 66, 9 May 1930, 138, 17.16 g = Cahn 61, 3 Dec. 1928, 60; i) Helbing, 12 Apr. 1927, 1639, 16.60 g = Helbing, 22 Mar. 1926, 57; j) Naville 5, 18 June 1923 (BM duplicates), 1173, 16.92 g
- 51 9 29 a) *Marseilles* 95, 16.58 g; b) † *M. Platt, 4 Dec. 1970, 61 = Bourgey, 29 May 1911 (Rhousopoulos), 61 = Bourgey, 15 Dec. 1909, 77; c) Kricheldorf, 12 June 1961, 177, 16.985 g; d) Peus, 14 June 1957, 19, 16.9 g = Ball 4, 5 Dec. 1932, 1938
- 52 9 30 a) Lee, 10–11 May 1954, 20, 17.18 g = *Riechmann 30, 11 Dec. 1924 (Berlin duplicates), 328; b) Hess, 18 Feb. 1936, 440, 16.81 g; c) Cahn, 26 Nov. 1930, 1134

Obv. As above, but below neck Φ I (O 10–16)

Rev. As above.

Φ I, combinations 53–84.

- 53 10 31 a) † *Naville 16, 3 July 1933, 843, 16.86 g = Naville 5, 18 June 1923 (BM duplicates), 1177; b) Feuardent, 17 Dec. 1919 (Collignon), 119
- 54 10 32 a) *Basel* 510, 16.38 g ← = Nanteuil 379; b) Leu-Münz. u. Med., 3–4 Dec. 1965 (Niggeler), 167, 16.83 g = Hirsch 32, 14 Nov. 1912, 376; c) Münz. u. Med. 6, 6–7 Dec. 1946, 574, 16.85 g; d) Basel 10, 15 Mar. 1938, 138, 16.43 g; e) *Helbing, 12 Apr. 1927, 1641, 16.95 g; f) Hirsch 33, 17 Nov. 1913, 511, 16.75 g; g) Sambon-Canessa, 19 Dec. 1907 (de

- Ciccio), 400, 17 g; h) Egger, 10 Dec. 1906, 215, 16.73 g
- 55** 11 33 a) Morgenthau, 15–16 Mar. 1938, 37 = *Schulman, 4 July 1922, 17, 17.40 g
- 56** 11 34 a) Syracuse 55558, 17.07 g †; b) SK Bern, FPL 37, Dec. 1981, 16; c) Raymond, 20 Sept. 1937, 278; d) Bourgey, 5 Dec. 1932, 110; e) Rosenberg 72, 11 July 1932, 208, 17.20 g = Rosenberg, 9 Mar. 1914, 46; f) Naville 12, 18 Oct. 1926 (Bissen et al), 991, 16.26 g; g) *Hirsch 31, 6 May 1912, 225, 16.70 g; h) Serrure, 28 Mar. 1906, 96; i) Egger, 28 Nov. 1904 (Prowe), 264, 17.25 g
- 57** 11 35 a) *SNG Lloyd* 1480, 16.73 g ↓; b) Rasmussen, 10–12 Mar. 1970, 464, 16.50 g; c) Glendining, 2 June 1930, 24; d) Helbing, 8 Nov. 1928, 3673, 16.9 g; e) *Sartiges* 145; f) J. Hamburger, 17 June 1908, 358; g) *Rollin-Feuarent, 22 May 1908, 185 = Hirsch 5, 20 May 1901, 56
- 58** 11 36 a) Naville 17, 3 Oct. 1934 (Burrage et al.), 274, 17.06 g = *Naville, 1, 4 Apr. 1921 (Pozzi), 642; b) Naville 5, 18 June 1923 (BM duplicates), 1178, 16.44 g
- 59** 11 37 a) † **SNGANS* 642, 17.09 g †; b) Hirsch 26, 24 May 1910, 441, 15.85 g; c) Rollin-Feuarent, 22 May 1908, 186 = Rollin-Feuarent, 20 June 1906, 539
- 60** 11 38 a) Naville 12, 18 Oct. 1926 (Bissen et al.), 990, 17.14 g; b) Hirsch 33, 17 Nov. 1913, 509, 17.10 g; c) *Ratto, 13 May 1912 (Numismatico Straniero), 510, 17.11 g; d) Sotheby, 6 May 1895 (Ashburnham), 56, 17.24 g
- 61** 11 39 a) Auctiones A.G. 6, 30 Sept.–1 Oct. 1976, 64, 16.28 g
- 62** 12 38 a) Fusco 18, 16.62 g
- 63** 12 39 a) Myers FPL, Mar. 1974, 22, 16.89 g; b) Münz. u.

- Med. FPL 279, Aug. 1967, 12; c) Coin Galleries, 26 Oct. 1961, 416, 16.6 g; d) *Sotheby, 27 Feb. 1908, 44
- 64** 12 40 a) † *SNGANS 640, 16.98 g ←; b) *McClean* 2817, 17.02 g →; c) Button 112, 19–20 Apr. 1966, 311; d) Kricheldorf 11, 11 Oct. 1962, 67, 17.695 g; e) Schulman, H., 29–31 Oct. 1953, 2179; f) Naville 16, 3 July 1933, 842, 16.76 g = Glendining, 14 June 1918, 62; g) Naville 10, 15 June 1925, 330, 16.72 g
- 65** 12 41 a) BM 1868–3–16 12, 16.90 g; b) Harvard, McDaniel c21, 16.78 g; c) Sotheby, 9–10 Mar. 1936 (Mavrojani), 122, 16.77 g; d) *Hess 207, 1 Dec. 1931, 192
- 66** 12 42 a) SNGANS 641, 16.375 g ↙; b) Hirsch 33, 17 Nov. 1933, 510, 16.24 g; c) *Hirsch 16, 6 Dec. 1906, 309, 16.5 g
- 67** 12 43 a) *Münz. u. Med., 5 Dec. 1968, 148, 17.18 g = Feuardent, 17 Dec. 1921 (Engle-Gros), 15; b) *Hirsch* 662, 17.24 g ↑
- 68** 12 44 a) NFA FPL 38, 1990, 15, 17.15 g; b) Münz. u. Med. FPL 271, Dec. 1966, 15, 17, 14 g; c) *Schlessinger 13, 4 Feb. 1935, 375, 17.1 g; d) Hess, 14 Dec. 1931, 192, 16.83 g
- 69** 12 45 a) Naville 12, 18 Oct. 1926 (Bissen et al.), 989, 17.12 g = Hirsch 32, 14 Nov. 1912, 377
- 70** 12 46 a) *Platt FPL, [1930] (coll. A.), 112
- 71** 13 45 a) † *SNGANS 643, 17.12 g ↘
- 72** 13 46 a) Sotheby, 26 July 1973, 6, 16.40 g = Naville 16, 3 July 1933, 835; b) Helbing, 24 Oct. 1927, 2698, 16.25 g
- 73** 13 47 a) *SNGHart* 216, 16.76 g ↘ = Glendining, 22 Jan. 1919 (Prevost), 2; b) *SNG Munich* 1209, 16.32 g ↗; c) *Glendining 10 Oct. 1951, 178, 16.85 g
- 74** 13 48 a) Vinchon, 24 Feb. 1971, 56; b) Kricheldorf, 7 Oct. 1957, 88 = Frey, 15–16 Apr. 1955, 1013, 16.07 g; c)

- Lempertz 237, 23 Feb. 1926, 146, 17.4 g =
Hamburger, 21 Nov. 1910, 73; d) *Riechmann 30,
11 Dec. 1924 (Berlin duplicates), 327, 17.10 g
- 75** 13 49 a) NFA FPL, Winter 1989, 67, 16.54 g; b) Gans
FPL, Winter 1962–1963, 7134
- 76** 13 50 a) Calico 18–19/25–26, Nov.–2 Dec. 1961, 293,
17.05 g
- 77** 14 49 a) *McClean* 2816, 17.07 g \uparrow = Sotheby, 8 Mar. 1892
(Tighe), 45 (2); b) Syracuse 25279, 16.65 g \downarrow ; c) Leu
7, 9 May 1973, 89, 17.15 g \downarrow ; d) \uparrow *Münz. u. Med.
FPL 329, Nov.–Dec. 1971, 164, 17.13 g; e) Hirsch,
G., 28–30 May 1962, 54; f) Naville 15, 2 July 1930,
405, 16.90 g
- 78** 14 50 a) *Vinchon, 27 Feb. 1961, 100, 17.06 g; b) Hirsch
33, 17 Nov. 1913, 508, 17 g = Merzbacher, 2 Nov.
1909, 2599; c) Santamaria, 7 Mar. 1910 (Hartwig),
647, 17.00 g
- 79** 15 50 a) Myers FPL, [1971] ("Greek Silver & Gold"), 16
- 80** 15 51 a) Münz. u. Med. FPL 333, Apr. 1972, 5, 16.89 g; b)
*Ball FPL 46, Jan. 1938, 48817; c) Cahn 75, 30 May
1932, 212, 17.11 g
- 81** 15 52 a) *SNGFitz* 1332, 16.70 g \downarrow ; b) Münz. u. Med. FPL
349, Sept. 1973, 2, 17.05 g; c) *Glendining, 1 Dec.
1927, 576, 17.02 g
- 82** 15 53 a) \uparrow **SNGANS* 636, 16.74 g \downarrow ; b) Roy's, 17–19 June
1968, 878; c) Feuardent, 17 Dec. 1919 (Collignon),
120, d) Bourgey, 14 Dec. 1911 (Chabenat), 57
- 83** 15 54 a) Knobloch FPL 35, Apr. 1969, F3 = *Knobloch
FPL 33, Apr. 1968, 863
- 84** 16 55 a) Malloy FPL 25, Dec. 1971–Jan. 1972, 270 =
Morgenthau 405, 5 Oct. 1939, 866, 18.00 g; b)
 \uparrow *Sotheby, 6 Feb. 1911, 216

KORE/NIKE WITH TROPHY SERIES

A-D, fine style

Obv. Head of Kore facing r. with earring, necklace, and grain in hair; to l. reading up **KOPΑΣ** (A-C)

Rev. Nike and trophy, in r. hammer, in l. nail; triskeles in r. field, to l. reading up **ΑΓΑΘΟΚΛΕΙΟΣ** (B-D), ground line

A, combinations 85–106. *Obv.* side and back tresses differentiated. *Rev.* **ΑΓΑΘΟΚΛΕΟΣ**, in exergue (R 56, 57, 61–64) or to l. reading up (R 58–60, 65, 66); in l. field **Α** (R 56–59, 61–63) or **Α** (R 60, 64–66); no necklace on Nike.

- 85** 17 56 a) † **SNGANS* 664, 16.87 g ↗ = Merzbacher, 15 Nov. 1910, 273 = Sambon-Canessa, 19 Dec. 1907 (de Ciccio), 409; b) *SNGFitz* 1348, 16.90 g ↖ = Bourgey, 23 May 1910, 48; c) NFA FPL 38, 1990, 16, 16.78 g; d) Münz. u. Med., 6–7 Dec. 1968, 27, 16.75 g = Cahn 84, 29 Nov. 1933, 164 = Hess, 25 Mar. 1929 (Vogel), 159 = Hirsch 34, 5 May 1914, 222 = Merzbacher, 2 Nov. 1909, 2608; e) Glendining, 25–28 Oct. 1955 (Lockett), 908 = *SNGLockett* 1004, 17.13 g ↘; f) *de Luynes* 1326, 17.22 g; g) Sotheby, 2 May 1905 (Warren), 224
- 86** 17 57 a) BM 1946–1–1 1488, 16.89 g → = *SNGLloyd* 1488 (double struck); b) Syracuse 25276, 17.16 g ↑; c) *SNGDelepierre* 703, 16.13 g ↑; d) *SNGCop* 764, 16.69 g ↘; e) NFA, 25 Mar. 1947, 1023; f) Naville 13, 27 June 1928 (Allatini et al.), 358, 16.43 g
- 87** 18 56 a) *SNGMunich* 1266, 16.770 g ↘; b) Sotheby, 24 Mar. 1971, 225 = Sotheby, 22 Apr. 1970, 69, 16.22 g; c) Hamburger 98, 3 Apr. 1933, 422, 16.67 g = Canessa 5, 12 June 1928 (Polese), 656 = Sambon-Canessa, 27 June 1927, 1028
- 88** 18 57 a) *McClean* 2835, 16.8 g ↑ = Sambon, 22 June 1906, 246; b) *Basel* 512, 16.62 g ←; c) Münz. u. Med., 5 Dec. 1968, 149, 17.01 g; d) Hess-Leu 36, 17 Apr.

- 1968, 103, 16.89 g; e) Hess-Leu, 27 Mar. 1956, 214; f) *Schlessinger 13, 4 Feb. 1935, 379, 17.2 g; g) Feuarden, 19 Dec. 1921, 62
- 89** 18 58 a) Hess, 6 Jan. 1926 (Löbbecke), 115, 16.85 g = Bourgey, 7 Dec. 1908, 111
- 90** 18 59 a) † *Gulbenkian 334, 17.08 g ↘; b) Frankfurter 118, 18–20 Jan. 1971, 1590, 17.11 g; c) Hess-Leu, 5–6 May 1965, 99, 17.22 g
- 91** 18 60 a) *BollN* FPL 11/4, Apr. 1974, 31; b) Leu-Münz. u. Med., 3–4 Dec. 1965 (Niggeler), 170, 16.98 g; c) Fusco 20, 16.87
- 92** 19 56 a) Helbing, 31 Jan. 1930, 144, 17.3 g = Naville 5, 18 June 1923 (BM duplicates), 1186
- 93** 19 57 a) Sotheby, 16 Nov. 1897 (Montagu II), 87
- 94** 19 58 a) *SNGFitz* 1347, 16.35 g ↙ (plated); b) Sotheby, 7 May 1975, 65, 16.65 g = Hess-Leu, 24 Mar. 1959, 104 = Schulman, 6–8 Mar. 1958, 3633 = Schulman, 4–6 Feb. 1957, 1200; c) Hirsch 21, 16 Nov. 1908 (Consul Weber), 719, 17.07 g = Hirsch 14, 27 Nov. 1905, 232 (double struck)
- 95** 19 61 a) † *Gulbenkian 336, 17.02 g ↑ (double struck) = Sambon, 27 June 1927, 1027 = Canessa, 22 May 1922 (Brandis), 284; b) *Frankfurt* 611, 16.83 g; c) Ratto FPL, Sept. 1922, 920, 16.70 = Naville 4, 17–19 June 1922 (Michailovitch-Evans), 396 = Hirsch 32, 14 Nov. 1912, 388
- 96** 19 62 a) Leu 7, 9 May 1973, 91, 16.95 g ↘ = *Hess-Leu, 16 Apr. 1957, 122; b) Hess-Leu, 2 Apr. 1958, 104, 16.98 g
- 97** 20 57 a) *SNGManchester* 508, 16.78 g ↘
- 98** 20 59 a) Sambon, 14 Mar. 1923, 363 = Hirsch 30, 11 May 1911 (Percy Barron), 418, 17.10 g; b) Hirsch 32, 14 Nov. 1912, 389, 16.90 g

- 99** 20 60 a) *SNGMunich* 1267, 16.768 g ↙; b) † **Gulbenkian* 335, 17.37 g ↘ = Glendining, 14 June 1918, 65 = Sotheby, 2 May 1905 (Warren), 223; c) Peus 270, 10–12 June 1969, 28, 15.89 g; d) *Sartiges* 147 = Egger, 10 Dec. 1906, 220, 17.08 g
- 100** 21 58 a) *SNGFitz* 1349, 16.28 g ↘ = Sotheby, 3 Feb. 1909 (Benson), 371; b) † **Dewing* 946, 16.76 g ↑ = Helbing, 8 Nov. 1928, 3676 = Ratto, 24 June 1929 (Rogers), 197; c) Bowers & Merena, 26–28 Mar. 1984, 3136, 16.71 g = Stack's 14 Sept. 1983 (J. P. Morgan), 28 = *Morgan* 153 = Sangiorgi, 15 Apr. 1907 (Strozzi), 1423; d) Coin Galleries, 13 July 1954, 846 = Schlessinger 13, 4 Feb. 1935, 383, 17 g; e) Canessa 5, 12 June 1928 (Polese), 655; f) Naville 5, 18 June 1923 (BM duplicates), 1187, 17.04 g = Hirsch 29, 9 Nov. 1910 (Lambros), 128 = Hirsch FPL 17, Feb. 1907, 551
- 101** 21 61 a) BM 1946–1–1 1489, 16.75 g ↗ = *SNGLloyd* 1489; b) Glendining, 10 Dec. 1986 (Knoepke), 98, 16.76 g ← = Ratto, 13 May 1912 (Numismatico Straniero), 514; c) Vinchon; 27 Feb. 1961, 101 = Hess, 7 May 1935, 274 = Hirsch 33, 17 Nov. 1913, 515, 16.95 g = Hirsch 20, 13 Nov. 1907, 188; d) Ciani-Vinchon, 6–8 Feb. 1956 (Hindamian), 269; e) Schulman, 8 June 1931, 69, 16.84 g = Canessa 5, 12 June 1928 (Polese), 657 = Sambon-Canessa, 27 June 1927, 1029; f) Fusco 21, 16.87 g; g) Naville 12, 18 Oct. 1926 (Bissen et al.), 997, 16.98 g = *Locker Lampson* 105 = *Weber* 1676
- 102** 21 63 a) Seaby FPL 768, Aug. 1982, B93; b) **Naville* 16, 3 July 1933, 849, 16.91 g = Hirsch 34, 5 May 1914, 223; c) Bourgey, 16 Mar. 1913, 37; d) Caprotti, 1 Mar. 1910, 437, 16.10 g
- 103** 21 64 a) *MFA* 463, 17.16 g = *Warren* 406; b) Münz. u. Med. FPL 369, July 1975, 19, 17.02 g; c) de Falco FPL 65,

June 1964, 153; d) NFA, 18 Nov. 1947, 1311; e) Sternberg 12, 18–19 Nov. 1982, 78, 16.95 g = Basel 4, 1 Oct. 1935, 538; f) *Helbing, 8 Nov. 1928, 3675, 16.78 g = Hirsch 20, 13 Nov. 1907 (Hoskier), 187; g) Ratto, 4 Apr. 1927, 436, 17.05 g; h) Hirsch 19, 11 Nov. 1907, 273, 16.80 g

- 104** 21 65 a) *SNGFabricius* 259, 16.87 g → = Santamaria, 24 Jan. 1938, A119; b) Glendining, 10 Dec. 1986 (Knoepke), 97, 17.02 g ↘ = Münz. u. Med. 6, 6–7 Dec. 1946, 576 = Hamburger 96, 25 Oct. 1932, 63 = Helbing, 20 Mar. 1928, 118 = Hess, 18 Mar. 1918, 240 = Hamburger, J., 17 June 1908, 362 = Hirsch 20, 13 Nov. 1907 (Hoskier), 189 = Sangiorgi, 15 Apr. 1907 (Strozzi), 1422; c) NFA 6, 27–28 Feb. 1979, 86, 16.34 g = Caprotti, 1 Mar. 1910, 436; d) Superior, 3–5 Oct. 1977, 917, 16.88 g = Gans FPL 28, Spring 1962, 6685 = Hess 202, 28 Oct. 1930, 2334 = Florange, 28 May 1924, 10; e) Glendining, 2 Feb. 1977, 257; f) Leu, 4 May 1976, 129, 16.97 g = Sotheby, 21 Feb. 1929 (Pritchard), 29; g) Sotheby, Zurich, 4–5 Apr. 1973 (Ward), 259, 17.0 g ↓ = Ward 320 = Sotheby, 31 May 1897 (R. Hobart Smith), 58; h) Kricheldorf, 1–2 July 1966, 44; i) Stack's, 27 June 1952, 1002 = Hamburger, 27 May 1929, 154, 17.22 g; j) BM 1918–2–4 81, 16.92 g (blotch over skirt and shield of trophy)

- 105** 22 65 a) † **Dewing* 947, 16.88 g → (blotch over skirt and shield of trophy)

- 106** 23 66 a) † **McClean* 2837, 17.12 g ↘ = Sotheby, 10–12 July 1890 (G. R. Smith), 492

B, combinations 107–24. Obv. tresses less separated. Rev. Nike stiffer and stockier, triskeles often counterclockwise (R 72, 74–76, 79, 80), necklace (except R 67).

- 107** 24 67 a) *SNGDelepierre* 706, 16.31 g ←; b) *SNGCop* 765, 16.20 g ↙; c) Rasmussen, 10–12 Mar. 1970, 465,

16.75 g = Naville 12, 18 Oct. 1926 (Bissen et al.), 995; d) † **Gulbenkian* 331, 16.70 g ↙ = Naville 5, 18 June 1923 (BM duplicates), 1182 = Hirsch 32, 14 Nov. 1912, 380 (die breaks at back of head, near alpha of legend, below nose)

- 108** 24 68 a) *SNGSpencer-Churchill* 71, 17.11 g ↖; b) *SNGHart* 227, 17.07 g ↓; c) *SNGDelepierre* 704, 16.70 g ↑ = Ratto, 24 June 1929 (Rogers), 195 = Hirsch 26, 24 May 1910, 110; d) *Gulbenkian* 330, 16.98 g ↖ = *Jameson* 866 = Sambon-Canessa, 19 Dec. 1907 (de Ciccio), 406; e) Vinchon, 24 Nov. 1969, 107; f) **Naville* 16, 3 July 1933, 847, 17.10 g = Sotheby, 3 Feb. 1909 (Benson), 368
- 109** 25 68 a) *de Luynes* 1324, 17.00 g; b) Ratto, 13 May 1912 (Numismatico Straniero), 513, 16.91 g = Rollin-Feuarent, 22 May 1908, 215
- 110** 25 69 a) BM RPK p263 B1, 16.05 g; b) *SNGManchester* 507, 16.69 g ↙ = Glendining, 18 Nov. 1940, 162; c) Feuarent, 17 Dec. 1919 (Collignon), 126 = **Sambon-Canessa*, 19 Dec. 1907 (de Ciccio), 405, 16.90 g
- 111** 25 70 a) † BM 1946-1-1 1490, 16.90 g ↑ = **SNGLloyd* 1490; b) *MFA* 462, 17.15 g = Sotheby, 23 Mar. 1896 (Montagu I), 168; c) Hirsch, G., 2-3 Apr. 1959, 772, 17.1 g; d) Schlessinger 13, 4 Feb. 1935, 378, 16.7 g
- 112** 25 71 a) **McClellan* 2836, 16.47 g ↑ = Sotheby, 23 June 1890 (Sim), 113
- 113** 26 70 a) Basel 10, 15 Mar. 1938, 139, 17.05 g
- 114** 26 72 a) **Gulbenkian* 332, 16.40 g ↖ = Sotheby, 20 July 1914 (Guzman), 107 = Sotheby, 3 July 1911 (Butler), 89; b) Helbing, 8 Nov. 1928, 3674, 17 g = Hirsch 33, 17 Nov. 1913, 513
- 115** 26 73 a) **Hamburger, J.*, 17 June 1908, 361
- 116** 26 74 a) *SNGSalting* 10, 17.45 g ↑; b) *SNGDelepierre* 705,

- 16.48 g ↖; c) Münz. u. Med., 19–20 June 1964, 81, 17.31 g = Sambon-Canessa, 19 Dec. 1907 (de Ciccio), 407; d) † *Münz. u. Med., 17 Nov. 1962, 424; e) Bourgey, 14 Dec. 1934, 53; f) Platt, 3 Apr. 1933, 59; g) Riechmann 30, 11 Dec. 1924 (Berlin duplicates), 335, 16.49 g
- 117** 26 75 a) Hirsch 32, 14 Nov. 1912, 381, 17.20 g; b) Sotheby, 3 Feb. 1909 (Benson), 369, 16.97 g = Sotheby, 15 June 1896 (Bunbury I), 477
- 118** 27 74 a) Schulman, H., 26–28 Apr. 1951, 3026 = Santamaria, 7 Mar. 1910 (Hartwig), 654, 16.70 g = Sambon, 22 June 1906, 242
- 119** 27 75 a) † *Gulbenkian 333, 17.12 g ↙ = Naville 13, 27 June 1928 (Allatini et al.), 357 = Hirsch 14, 27 Nov. 1905, 229; b) Bourgey, 5 Dec. 1932, 115 = Rollin-Feuardent, 22 May 1908, 213 = Hirsch 7, 2 June 1902, 148; c) Rolling-Feuardent, 22 May 1908, 214 = Hirsch 15, 28 May 1906, 1240, 16.75 g; d) Sotheby, 24 Apr. 1907 (Delbeke), 66, 16.72 g
- 120** 27 76 a) Santamaria, 12–13 Oct. 1949, 405, 16.86 g = *Hirsch 32, 14 Nov. 1912, 383; b) Hamburger 98, 3 Apr. 1933, 420, 16.12 g; c) Hirsch 17, Feb. 1907, 551³
- 121** 27 77 a) *Sternberg 13, 17–18 Nov. 1983, 97, 17.10 g
- 122** 27 78 a) *SNGANS 665, 17.09 g ↘ = Hirsch 29, 9 Nov. 1910 (Lambros), 127; b) BM 1946–1–1 1492, 16.61 g ↑ = SNG Lloyd 1492 (double struck); c) Glendining, 25 Oct. 1955, 907, 16.84 g ↓ = SNG Lockett 1003 = Naville 1, 4 Apr. 1921 (Pozzi), 645; d) Vinchon, 20–22 May 1959, 417, 16.70 g = Feuardent, 17 Dec. 1919 (Collignon), 127; e) Sambon, 14 Mar. 1923, 364
- 123** 28 79 a) *Platt, 26–27 Mar. 1922 (Luneau), 297 = Hirsch 31, 6 May 1912, 227, 16.55 g = Hirsch 16, 6 Dec. 1906, 312 (double struck); b) Hirsch 32, 14 Nov. 1912, 382, 16.84

- 124** 28 80 a) † *Glendining, 24 Nov. 1950, 1529 = Naville 5, 18 June 1923 (BM duplicates), 1183, 16.93 g = Hirsch 33, 17 Nov. 1913, 514

C, combinations 125–34. Obv. little or no gap in tresses. Rev. Nike leans slightly backward, necklace.

- 125** 29 81 a) Schulman, 5 June 1930, 41, 16.87 g = † *Glendining, 3 Dec. 1929 (Nordheim-Anderson), 715 = Helbing, 12 Apr. 1927, 1643 = Merzbacher, 2 Nov. 1909, 2607

- 126** 29 82 a) Hess-Leu, 12–13 Apr. 1962, 114, 16.88 g; b) Schulman, 31 May 1938, 101, 16.05 g = Cahn 75, 30 May 1932, 213 = Ratto, 24 June 1929 (Rogers), 196 = *Ratto, 4 Apr. 1927, 435; c) Feuarent, 8 July 1919 (Ready), 217

- 127** 29 83 a) Ciani-Vinchon, 6–8 Feb. 1956 (Hindamian), 268 = Platt, 26–27 Mar. 1922 (Luneau), 298 = Bourgey, 7 June 1909, 176; b) Hirsch 26, 24 May 1910, 447, 17.08 g; c) *BM 1859–12–19 88, 16.83 g = Head, *Ancients*, Plate 35, #29 (die break at lip); d) Sotheby, Zurich, 4–5 Apr. 1973 (Ward), 260, 16.67 g ↘ = Ward 321 (die break at lip); e) Leu-Münz. u. Med., 3–4 Dec. 1965 (Niggeler), 169, 16.89 g = Hirsch 32, 14 Nov. 1912, 384 (die break at lip); f) Naville 12, 18 Oct. 1928 (Bissen et al.), 994, 17.13 g (die break at lip)

- 128** 29 84 a) Hess-Leu, 6–7 Dec. 1966, 157, 17.11 g = Hesperia FPL 21, [1962], 15

- 129** 30 84 a) † *SNGANS 668, 17.09 g ↙ = Merzbacher, 2 Nov. 1909, 2606; b) BM 1946–1–1 1491, 16.47 g ↑ = SNG Lloyd 1491 = Ciani, 12 Dec. 1921, 14

- 130** 30 85 a) Naville 16, 3 July 1933, 848, 17.01 g = Egger 46, 11 May 1914 (Prowe et al.), 90 = Hirsch 12, 17 Nov. 1904, 83; b) Hess 207, 1 Dec. 1931, 194, 16.69 g =

Naville 6, 28 Jan. 1924 (Bement), 536 = *Rollin-Feuarent, 9 May 1910 (Duruflé), 247

- 131** 31 85 a) Frey, 16 Apr. 1955, 1015, 15.92 g
- 132** 31 86 a) Münz. u. Med. 54, 26 Oct. 1978, 129, 17.05 g; b) Knobloch FPL 27, May 1965 (Gillespie), 115, 17 g = Naville 10, 15 June 1925, 301 = Naville 4, 17-19 June 1922 (Michailovitch-Evans), 395 = † *Weber 1675
- 133** 32 86 a) Peus, 30 Oct.-2 Nov. 1972, 64, 16.60 g = Münz. u. Med., 11-12 Feb. 1972, 25 (die break at forehead)
- 134** 32 87 a) *Wheaton* 49, 16.47 g →; b) Gans, 19 Apr. 1960 (Bauer), 205, 16.55 g; c) Helbing, 24 Oct. 1929, 2701, 16.6 g; d) † *SNGANS 666, 16.95 g ↙ = Merzbacher, 15 Nov. 1910, 272 = Santamaria, 6 Apr. 1908 (Stiavelli), 215 (die break at forehead); e) SNGANS 667, 16.59 g ↘ = Hess 207, 1 Dec. 1931, 193 (die break at forehead); f) Stack's, 27 Aug. 1940, 33, 16.5 g = Sambon, 11 Dec. 1901, 282 (die break at forehead); g) Sambon-Canessa, 19 Dec. 1907 (de Ciccio), 408, 16.90 g = Sambon, 22 June 1906, 245 = *Morgan* 152 (die break at forehead); h) Hirsch 18, 27 May 1907, 2296, 16.73 g

D, combinations 135-36. Obv. ΣΥΡΑΚΟΣΙΩΝ to r. reading down.

- 135** 33 88 a) SNGANS 669, 16.64 g ↖; b) † *Hirsch 14, 27 Nov. 1905, 228, 17.05 g
- 136** 34 89 a) † BM 1868-3-16 14, 16.88 g; b) *McClean* 2834, 16.86 g →; c) Sotheby, 26 July 1973, 7, 16.66 g = Rasmussen, 10-12 Mar. 1970, 466; d) Leu FPL, Sept. 1962 ("Sicilia,"), 125, 16.50 g = Platt, 18 Nov. 1935 (Bougon), 33 = Hirsch 30, 11 May 1911 (Percy Barron), 416; e) Dorotheum, 26-27 Mar. 1957 (Zeno), 3458, 16.5 g; f) Hess, 14 Apr. 1954, 74, 16.90 g = *Sambon, 22 June 1906, 241 = *Jameson* 865; g) Baranowsky FPL, 1934, 4720; h) *de Luynes* 1325, 17.10 g;

i) Hirsch 32, 14 Nov. 1912, 379, 16.93 g; j) Sambon-Canessa, 19 Dec. 1907 (de Ciccio), 404, 16.85 g (double struck); k) Sambon-Canessa, 19 Dec. 1907 (de Ciccio), 404A, 16.85 g; l) Hamburger 98, 3 Apr. 1933, 419, 17.22 g

E-J, barbarous style

Obv. Head of Kore facing r., to l. reading down ΚΟΡΑΣ (E-H)

Rev. Nike and trophy, ground line, to l. reading up ΑΓΑΘΟ-ΚΛΕΙΟΣ (E-I), triskeles in l. field (E-I)

E, combinations 137-84. *Obv.* lettering small, closely set, head often small. *Rev.* triskeles counterclockwise (R 94, 94R, 104), no ground line (R 102, 105, 110, 112, 114, 120).

- | | | | |
|------------|----|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 137 | 35 | 90 | a) *Naville 16, 3 July 1933, 852, 16.88 g |
| 138 | 35 | 91 | a) <i>McClean</i> 2839, 16.58 g →; b) Baranowsky FPL, 1934, 4721 = Hamburger 98, 3 Apr. 1933, 421, 17.10 g; c) *Serrure, 10 Apr. 1911, 14 = Sambon-Canessa, 19 Dec. 1907 (de Ciccio), 410 = Sangiorgi, 15 Apr. 1907 (Strozzi), 1424 |
| 139 | 35 | 92 | a) <i>SNGManchester</i> 504, 16.88 g ↗ = Glendining, 27-28 May 1941 (Gantz) 97; b) Glendining, 9 Mar. 1931, 980, 16.95 g = *Bourgey, 27 Mar. 1912, 141 |
| 140 | 35 | 93 | a) Seaby FPL 720, Aug. 1978, C773, 17.01 g = Seaby FPL 704, Apr. 1977, C243; b) Santamaria, 25 Oct. 1951, A367, 17 g; c) *Grabow, 9 July 1930, 213, 17.1 g |
| 141 | 35 | 94 | a) † *BM 1946-1-1 1497, 16.91 g ↑ = <i>SNGLloyd</i> 1497 |
| 142 | 36 | 95 | a) † *BM 1946-1-1 1499, 16.98 g ↘ = <i>SNGLloyd</i> 1499; b) Seaby FPL 852, July/Aug. 1990, B137; c) Delmonte, 22 Apr. 1933, 39 = Cahn 68, 26 Nov. 1930, 1136 = Helbing, 8 Nov. 1928, 3681, 17.23 g = Ratto, 8 Feb. 1928, 2464 |
| 143 | 36 | 96 | a) *Schulman, 28-30 May 1973, 1135 |
| 144 | 37 | 97 | a) Syracuse 55560, 17.25 g ↖; b) New England, 24-26 July 1980, 1878; c) † *Ball 6, 9 Feb. 1932, 56, 15.3 g |

- 145** 38 98 a) *Naville 6, 28 Jan. 1924 (Bement), 537, 16.88 g
- 146** 38 99 a) † *SNGANS 674, 16.975 g →; b) Vinchon, 24 Feb. 1971, 57 = Bourgey, 14 Dec. 1911 (Chabenat), 58; c) Ball FPL 39, Apr. 1937, 160, 17.2 g = Schlesinger 13, 4 Feb. 1935, 381
- 147** 38 94R a) *Hess 207, 1 Dec. 1931, 196, 17.23 g = Hamburger, 11 June 1930, 642 = Naville 10, 15 June 1925, 332 = Ratto FPL, Sept. 1922, 921
- 148** 39 94R a) Münz. u. Med. FPL 342, Feb. 1973, 19, 16.62 g
- 149** 39 100 a) *Frankfurter 113, 16–18 Jan. 1967, 585, 17.2 g
- 150** 39 101 a) Syracuse 55566, 17.25 g ↗; b) SNGManchester 506, 16.98 g ↘ = Sotheby, 20 Dec. 1920 (Peterson), 65; c) *Dewing 949, 16.97 g ↘; d) MFA², 34, 17.18 g ←; e) Sambon-Canessa, 27 June 1927, 1034, 17 g
- 151** 39 102 a) *Cefalù VII bb2, 16.94 g (large flaw at base of trophy post and across border to lower r.)
- 152** 39 103 a) † *BM 1866–12–1 663, 14.83 g
- 153** 39 104 a) Syracuse 55891, 16.71 g ↘; b) SNGAarhus 341, 16.91 g →; c) Knobloch FPL 31, Oct. 1967, 52, 16.7 g = *Naville 16, 3 July 1933, 851; d) Helbing FPL 17, [1934], 158, 16.9 g; e) Helbing 70, 9 Dec. 1932, 528, 16.9 g = Helbing, 31 Jan. 1930, 145 = Helbing, 12 Apr. 1927, 1645; f) Helbing, 8 Nov. 1928, 3680, 17.95 g; g) Helbing, 12 Apr. 1927, 1644, 16.9 g = Helbing, 22 Mar. 1926, 58
- 154** 39 105 a) *Naville 5, 18 June 1923 (BM duplicates), 1184, 17.15 g
- 155** 39 106 a) Syracuse 25277, 17.00 g ↓
- 156** 40 105 a) Riechmann 30, 11 Dec. 1924 (Berlin duplicates), 336, 17.01 g
- 157** 40 106 a) Peus FPL 32, Dec. 1972, 8; b) Schulman, 19 Nov. 1963, 65, 17.049 g = Münz. u. Med. FPL 218, Jan.

- 1962, 12; c) *Ciani, 20 Nov. 1935 (Grandprey), 81, 16.80 g
- 158** 40 107 a) Syracuse 55559, 17.13 g ← b) Schulman, 18–21 Mar. 1963, 2164 = *Schulman, 9–12 Mar. 1959, 1308, 16.60 g
- 159** 40 108 a) Stack's, 6–7 Sept. 1973, 339, 17.23 g; b) † *Glen-dining, 9 July 1963, 77
- 160** 40 109 a) Seaby 2, 15 July 1929, 245 = *Cahn 60, 2 July 1928 ("Num. in Kleinasien"), 236, 16.95 g
- 161** 41 104 a) ANA, 24 Aug. 1976, 1517, 17.17 g; b) Malloy, 28 Mar. 1973, 133
- 162** 41 108 a) Seaby FPL 832, July/Aug. 1988, B145; b) Schulman, H., 23–24 Mar. 1956, 654
- 163** 41 109 a) Auctiones A. G., 7–8 June 1977, 93, 17.02 g; b) Stack's 5–6 Mar. 1971, 119, 16.83 g; c) de Falco FPL 68, Mar. 1965, 128; d) Naville 16, 3 July 1933, 850, 16.95 g
- 164** 41 110 a) † *SNGANS 672, 17.02 g ♂; b) Superior, 13–16 June 1977, 2569, 16.98 g
- 165** 41 111 a) Syracuse 55563, 17.00 ♂; b) Münzschat, 6 Apr. 1974, 18, 17.05 g
- 166** 41 113 a) *SNGANS 673, 17.23 g ↑;
- 167** 42 111 a) † *Münz. u. Med. FPL 329, Nov.–Dec. 1971, 165, 17.03 g
- 168** 42 112 a) Syracuse 25278, 16.39 g ♂; b) Hirsch, G., 26–28 Oct. 1954, 1290 = Helbing FPL 17, [1934], 160, 17.1 g = Naville 16, 3 July 1933, 853; c) Cefalù VII bb1, 17.09 g
- 169** 43 112 a) Coin Galleries FPL 8/1, 1967, A14, 14.95 g; b) † Lee, 10–11 May 1954, 23, 16.98 g = *Ratto, 9 Oct. 1934, 75

- 170** 43 113 a) Naville 12, 18 Oct. 1926 (Bissen et al.), 996, 15.61 g
- 171** 43 114 a) Sotheby, 28 Sept. 1973, 8, 16.90 g ↙ = Sotheby, Zurich, 4–5 Apr. 1973 (Ward), 261 = *Ward 322; b) Santamaria, 12–13 Oct. 1949, 406, 16.61 g; c) Helbing, 31 Jan. 1930, 146; d) Feuarent, 11–14 June 1913 (Burel), 110
- 172** 44 114 a) Knobloch FPL 25, Dec. 1964 (Westervelt), 41; b) Davis 57, 16.21 g ←
- 173** 44 115 a) † *SNGANS 675, 15.95 g ↗; b) Baranowsky FPL, 1934, 4721a = Canessa 5, 12 June 1928 (Polese), 658 = Sambon-Canessa, 27 June 1927, 1031, 17 g
- 174** 45 115 a) Dorotheum, 26–27 Apr. 1961 (Hollschek), 1094, 16.25 g
- 175** 45 116 a) † *SNGANS 677, 16.91 g →; b) BM 1946–1–1 1495, 17.26 g = SNGLLoyd 1495 = Canessa, 22 May 1922 (Brandis), 286; c) SNGFitz 1345, 17.12 g ↗ = Sotheby, 6 Jan. 1845 (Till), 228; d) Stack's 4 Dec. 1976, 36, 15.94 g; e) Glendining, 5 Mar. 1970, 275; f) de Nicola FPL, Sept. 1960, 172; g) Bolender, 29 Sept. 1937, 45; h) Basel 4, 1 Oct. 1935, 539, 17.15 g; i) Hess 207, 1 Dec. 1931, 195, 17.23 g = Hamburger, 11 June 1930, 641
- 176** 45 117 a) *Stack's, 10–11 June 1970, 149, 16.9 g
- 177** 45 118 a) *Hirsch, G., 9–10 Dec. 1965, 1556, 17 g
- 178** 46 118 a) SNGMunich 1263, 16.837 g →; b) † Sambon-Canessa, 27 June 1927, 1033, 17.20 g; c) Egger 46, 11 May 1914, 91, 17.13 g
- 179** 47 118 a) † Leu FPL, Sept. 1962 ("Sicilia"), 126, 17.15 g = Button 99, 2–3 Oct. 1958, 28
- 180** 48 119 a) † *BM 1867–1–1 450, 17.27 g; b) SNGDavis 83, 16.95 g →; c) Grabow 14, 27 July 1939, 152 = Ball FPL 46, Jan. 1938, 48818

- 181** 49 120 a) *Raymond, 31 Jan. 1939, 260 (die break across triskeles, Nike's hips, l. wing); b) Feuardent, 17 Dec. 1919 (Collignon), 128 (die break across triskeles, Nike's hips, l. wing)
- 182** 49 121 a) Kricheldorf FPL, Apr. 1958, 126 = Kricheldorf, 7 Oct. 1957, 89 = Frey, 12 Jan. 1957, 14, 16.95 g; b) *Santamaria, 12–13 Oct. 1949, 407, 16.90 g
- 183** 49 122 a) † *SNGANS 676, 16.81 g ♂; b) Santamaria, 7 Mar. 1910 (Hartwig), 665, 16.60 g
- 184** 49 123 a) *Syracuse 55893, 16.87 g ♂; b) Harvard 1976. 79–3725 (Ramage 135), 17.07 g
- F, combinations 185–218. Obv. coarse hair. Rev. legend in exergue (R 126), triskeles counterclockwise (R 135, 140).
- 185** 50 124 a) † *Naville 15, 2 July 1930, 407, 16.91 g
- 186** 51 125 a) *BM 1946–1–1 1496, 17.37 g = *SNG*Lloyd 1496; b) Myers FPL, May 1972, 12; c) Gans, 19 Apr. 1960 (Bauer), 206; d) Hamburger, 27 May 1929, 155, 16.45 g; e) Naville 5, 18 June 1923 (BM duplicates), 1185, 17.49 g
- 187** 51 126 a) † SNGANS 670, 17.26 g ♀; b) Glendining, 9 July 1963, 76
- 188** 52 126 a) † BM RPK p263B 3, 16.80 g (blotch between l. thigh and wing); b) Princeton 3129, 16.65 g ♂
- 189** 53 126 a) † *SNGANS 671, 17.69 g ♂; b) *McClean* 2838, 16.68 g ♂ = Sotheby, 23 June 1890 (Sim), 113
- 190** 53 127 a) *Sotheby, 9–10 Mar. 1936 (Mavrojani), 124 = Naville 1, 4 Apr. 1921 (Pozzi), 646, 16.65 g
- 191** 53 128 a) BM 1947–4–6 110, 16.84 g; b) Parke-Bernet, 16–17 Oct. 1968 (Newell), 10
- 192** 53 129 a) Superior, 3–5 Oct. 1977, 916, 17.17 g = Schulman, H., 18–21 Mar. 1964, 21; b) Malloy, 15 Mar. 1974, 85a; c) Coin Galleries, 12–13 Nov. 1964, 438 = Santamaria, 25 Oct. 1951, A368; d) Knobloch FPL 23, Fall

- 1963, 112 = Ciani-Vinchon, 6–8 Feb. 1956 (Hindamian), 270; e) Schlessinger 13, 4 Feb. 1935, 380, 17 g; f) Sambon-Canessa, 27 June 1927, 1030, 16.50 g
- 193** 54 128 a) † BM RPK p263B 2, 16.90 g; b) Syracuse 55565, 17.05 g ♂; c) *Wulfin* 117, 16.21 g ♂; d) Glendining, 25 Oct. 1955 (Lockett), 909, 16.45 g ↓ = *SNG*Lockett 1005 = Ratto, 4 Apr. 1927, 437 = Santamaria, 7 Mar. 1910 (Hartwig), 656; e) *Hess 208, 14 Dec. 1931, 125, 17.07 g; f) Hirsch 32, 14 Nov. 1912, 385, 16.74 g
- 194** 54 129 a) BM 1949–4–11 204, 17.44 g
- 195** 54 130 a) *BM 1866–12–1 662, 17.19 g
- 196** 54 131 a) *Ratto, 24 June 1929 (Rogers), 198, 15.25 g
- 197** 55 132 a) Coin Galleries, 16 Aug. 1983, 39, 16.90 g; b) Coin Galleries, 20 Apr. 1961, 78, 17.55 g; c) Ratto FPL 14, 1935, 1275, 16.58 g; d) *Naville 16, 3 July 1933, 854, 16.55 g; e) Rosenberg 69, 2 Dec. 1930, 2302, 16.8 g
- 198** 55 133 a) † *Ciani-Vinchon, 6–8 Feb. 1956 (Hindamian), 271
- 199** 55 134 a) *SNG*Cop 766, 17.15 g ↓; b) *Münz. u. Med., 2–3 Dec. 1975, 51, 17.24 g
- 200** 56 129 a) † *BM 1946–1–1 1500, 16.63 g ↓ = *SNG*Lloyd 1500
- 201** 56 134 a) *Hunter* 160, 16.98 g
- 202** 56 135 a) Syracuse 55561, 16.85 g →; b) Syracuse 55562, 17.00 g ←; c) *SNG*Fitz 1346, 17.06 g; d) **Dewing* 948, 16.78 g = Helbing, 8 Nov. 1928 (Lloyd duplicates), 3678; e) Sotheby, 23 July 1975, 8; f) Stack's, 5–6 Mar. 1971, 120, 16.99 g
- 203** 56 136 a) *Naville 1, 4 Apr. 1921 (Pozzi), 647, 17.12 g
- 204** 57 136 a) Peus 90, 5–7 Oct. 1976, 72, 15.37 g; b) Kress, 26 Nov. 1951, 27, 16.6 g
- 205** 57 137 a) † *Münz. u. Med. FPL 288, May 1968, 14, 16.72 g
- 206** 57 138 a) **SNG*Tübingen 676, 16.87 g ♂

- 207** 57 139 a) Münz. u. Med. FPL 333, Apr. 1972, 6, 16.63 g; b) Hamburger, 29 May 1929, 151, 16.70 g
- 208** 57 140 a) Seaby FPL 671, July 1974, A353
- 209** 58 139 a) † *Helbing FPL 17, [1934], 159, 17 g = Helbing, 8 Nov. 1928, 3677
- 210** 58 141 a) SK Bern FPL 39, Dec. 1982, 39, 16.25 g; b) Malloy FPL 22, May 1971, 365 = Knobloch FPL 33, Apr. 1968, 428; c) *Hamburger, 27 May 1929, 156, 16.70 g
- 211** 59 140 a) *Stack's, 6–7 Sept. 1973, 338, 16.74 g = Coin Galleries, 14 Feb. 1973, 74
- 212** 59 142 a) † *SNGANS 679, 16.92 g →
- 213** 59 143 a) *SNGFitz 1344, 17.08 g ↗ = Sotheby, 8 July 1844 (Thomas), 734
- 214** 59 144 a) *BM 1841–7–26 401, 17.02 g
- 215** 59 145 a) *Davis 58, 17.13 g ←
- 216** 59 146 a) Myers, 5 Dec. 1974, 53
- 217** 60 146 a) Sternberg 10, 25–26 Nov. 1980, 27, 16.99 g; b) Schulman; H., 26 Feb.–1 Mar. 1973, 576, 16.90 g; c) † Hirsch, G., 9–10 Dec. 1965, 1555, 16.80 g; d) Hirsch 20, 13 Nov. 1907 (Hoskier), 186, 17.17 g = Hirsch 13, 15 May 1905 (Rousopoulos), 460
- 218** 61 146 a) † *Stack's, 19–20 June 1969 (Fowler), 62, 16.48 g
G, combinations 219–32. Obv. Kore's head often small. Rev. no ground line (R 148, 151)
- 219** 62 147 a) *Naville 16, 3 July 1933, 855, 16.95 g
- 220** 62 148 a) Cahn 65, 15 Oct. 1929, 91, 16.91 g = † *Helbing, 24 Oct. 1927, 2702
- 221** 63 147 a) Schulman 243, 8–10 June 1966 (Graham), 1107, 16.9 g; b) Münz. u. Med. FPL 253, Apr. 1965, 20, 16.20 g; c) Cefalù VII aa2, 16.81 g

- 222** 63 148 a) Myers FPL, Mar. 1974, 23
- 223** 63 149 a) *Stack's, 17 May 1983, 74, 16.94 g = Dorotheum, 26–27 Apr. 1961 (Hollschek), 1093
- 224** 63 150 a) † *SNGANS 680, 16.89 g †; b) Naville 17, 3 Oct. 1934 (Burrage et al.), 275, 17.23 g
- 225** 63 151 a) *SNGManchester 505, 16.78 g ↘ = Glendining, 27–28 May 1941 (Gantz), 97
- 226** 64 151 a) Auctions A.G. 6, 30 Sept.–1 Oct. 1976, 66, 16.98 g
- 227** 64 152 a) † *BM 1946–1–1 1498, 16.98 g ↘ = SNGLloyd 1498; b) Vinchon; 17–18 Dec. 1973, 4; c) Salton-Schlessinger FPL, Sept. 1961, 10 = Salton-Schlessinger, 22 Nov. 1955, 684, 15.6 g; d) de Nicola FPL, Mar. 1960, 214, 16.40 g
- 228** 64 153 a) SNGMunich 1265, 15.672 g ↗; b) *Baranowsky FPL, 1929, 1591/a
- 229** 65 154 a) Syracuse 55564, 17.29 ↓; b) *Coin Galleries FPL 5/2, 1964, B42, 17.9 g (double struck)
- 230** 65 155 a) *Syracuse 55892, 16.83 g →
- 231** 65 156 a) Coin Galleries FPL 9/4, 1968, D31, 16.88 g; b) *Barcelona ANE, 5–7 July 1963, 200, 16.05 g; c) Schulman, H., 21–22 June 1957, 1490; d) Ciani FPL, (uncertain date), 70
- 232** 65 157 a) † *SNGANS 678, 16.82 g †; b) Gibbons FPL 9, Spring 1976, 37 = Glendining, 20 Nov. 1975, 806, 16.96 g = Helbing 70, 9 Dec. 1932, 529 = Cahn 71, 14 Oct. 1931, 195 = Hess 202, 28 Oct. 1930, 2332 = Cahn 65, 15 Oct. 1929, 90 = Cahn 60, 2 July 1928 ("Num. in Kleinasien"), 235; c) Hirsch, G., 21–22 Feb. 1963, 1145; d) Schulman, H., Mar. 1960, 4542

H, combinations 233–37. Rev. no ground line (R 158, 160)

- 233** 66 158 a) *Myers FPL 7, Mar. 1974, 19

- 234** 66 159 a) † Hirsch, G., 21–22 Feb. 1963, 1146
- 235** 67 159 a) † *Stack's, 13–14 Sept. 1974, 764, 16.82 g = Morgenthau, 15–16 Mar. 1938, 38
- 236** 67 160 a) Coin Galleries, 18 July 1973, 190, 16.6 g = Coin Galleries FPL 11/1–3 1970, A11; b) Baranowsky FPL, 1929, 1591/b; c) *Helbing, 8 Nov. 1928 (Lloyd duplicates), 3679
- 237** 68 160 a) † Syracuse 55567, 17.21 g \
- I, combinations 238–41. Obv. Kore facing l., to r. reading up **KORAS**. Rev. no ground line (R 163)
- 238** 69 161 a) BM RPK p263 B4, 16.68 g; b) Syracuse 55894, 16.75 g \; c) † *SNGANS 681, 16.91 g ←; d) *SNGFitz* 1350, 17.07 g; e) *SNGManchester* 509, 17.11 g \ = Glendining, 27–28 May 1941 (Gantz), 97; f) *SNGMunich* 1262, 16.822 g ^; g) *Dewing* 950, 16.65 g →; h) Münz. u. Med., 16–17 Nov. 1974, 69, 17.02 g; i) Münz. u. Med. FPL 260, Dec. 1965–Jan. 1966, 17, 16.44 g; j) Naville 6, 28 Jan. 1924 (Bement), 538, 16.90 g = Egger 40, 2 May 1912 (Prowe), 437 = Hamburger, 21 Nov. 1910, 72 = Hirsch 14, 27 Nov. 1905, 231
- 239** 70 161 a) † BM 1946–1–1 1494, 16.73 g \ = *SNGLloyd* 1494
- 240** 70 162 a) Ratto FPL 14, 1935, 1278, 17.20 g = * Ratto, 9 Oct. 1934, 76; b) *de Luynes* 1327, 16.97 g
- 241** 70 163 a) Coin Galleries, 12 Mar. 1970, 55, 17.15 g = *Hesperia FPL 21, [1962], 16
- J, combination 242. Obv. to r. reading down **ΑΓΑΘΟΚΛΕΙΟΣ**, order of dots
- Rev. no legend, Nike's body elongated, triskeles in r. field
- 242** 71 164 a) BM 1946–1–1 1493, 16.78 g = † **SNGLloyd* 1493
b) Leu 13, 29–30 Apr. 1975, 74, 17.03 g

KEY TO PLATE 1

1. Syracuse, AR tetradrachm, Arethusa/quadrigea
(*SNGANS* 637; O 2, R 5)
2. Syracuse, AR tetradrachm, Arethusa/quadrigea
(*SNGANS* 643; O 13, R 45)
3. Syracuse, AR tetradrachm, Kore/Nike with trophy
(*SNGANS* 664; O 17, R 56)
4. Syracuse, AR tetradrachm, Kore/Nike with trophy
(*SNGANS* 673; O 41, R 113)
5. Syracuse, AV drachm, laureate head of Apollo/biga
(*SNGANS* 551)
6. Syracuse, AR stater (full-weight), helmeted Athena/Pegasus
(*SNGANS* 555)
7. Syracuse, AR stater (reduced-weight), helmeted Athena/Pegasus
(*SNGANS* 682)
8. Syracuse, AV stater, male head (Agathocles?) in elephant headdress/
Athena Nike
(Kunsthistorisches Museum, Vienna)
9. Ptolemy I, AR tetradrachm, Alexander III in elephant headdress/
Athena Promachos
(*ANS* 1944.100.75470)
10. Syracuse, AV stater, male head (Agathocles?) in elephant head-
dress/Athena Nike
(*Basel* 511)
11. Syracuse, AV stater (reduced-weight), helmeted Athena/thunder-
bolt
(*SNGANS* 702)
12. Syracuse, AE litra?, head of Artemis Soteira/thunderbolt
(*SNGANS* 712)
13. Syracuse, AE hemilitron, head of Persephone/bull butting left
(*SNGANS* 562)
14. Syracuse, EL 25 litrai piece, laureate head of Apollo/tripod
(*SNGANS* 624)

15. Siculo-Punic AR tetradrachm, Heracles-Melqart/horse's head and palm tree
(ANS 1944.100.)
16. Seleucus I, AR tetradrachm, helmeted male head/Nike crowning a trophy
(ANS 1944.100.74108)

ABBREVIATIONS

1. Collections

BM: British Museum, registration numbers

Harvard: Sackler Gallery, Harvard University, Cambridge, Massachusetts

Princeton: Princeton University Art Museum, Princeton, New Jersey

Stanford: Stanford Art Museum, Stanford University, Palo Alto, California

Syracuse: Museo Archeologico di Siracusa, inventory numbers (R. R. Holloway, *Ripostigli del Museo Archeologico di Siracusa* [Naples, 1989])

2. Publications

Basel: H. A. Cahn, *Griechische Münzen aus Grossgriechenland und Sizilien; Antikenmuseum Basel und Sammlung Ludwig* (Basel, 1988)

BollN: *Bollettino Numismatico di Luigi Simonetti* (Florence)

Cefalù: A. H. Lloyd, "A Recently Discovered Hoard of Greek and Siculo-Punic Coins," *NC* 1925, pp. 151–72 and plates V–VII (Cefalù 1925 hoard = *IGCH* 2154)

Davis: H. A. Troxell, *The Norman Davis Collection* (New York, 1969)

Dewing: L. Mildenberg and S. Hurter, eds., *The Arthur S. Dewing Collection of Greek Coins* (New York, 1985)

Frankfurt: G. Förschner, *Die Münzen der Griechen in Italien und Sizilien; die Bestände des Münzkabinetts Historisches Museum Frankfurt am Main* (Melsungen, 1986)

Fusco: Gentili, *A/IN* 1956, pp. 101–109 and plate VIII (Syracuse/Fusco 1955 hoard = *IGCH* 2179)

- Gulbenkian:** E. S. G. Robinson and M. Castro Hipólito, *A Catalogue of the Calouste Gulbenkian Collection of Greek Coins*, part 1 (Lisbon, 1971)
- Head, Ancients:** B. V. Head, *A Guide to the Principal Gold and Silver Coins of the Ancients*, 2nd ed. (London; 1881)
- Head, Greeks:** B. V. Head, *Principal Coins of the Greeks, from c. 700 B.C. to A.D. 270* (London, 1932)
- Hirsch:** P. Naster, *La collection Lucien de Hirsch. Catalogue des monnaies grecques* (Brussels, 1959)
- HN:** B. V. Head, *Historia Numorum* (Oxford, 1911)
- Hunter:** G. MacDonald, *Catalogue of Greek Coins in the Hunterian Collection*, vol. 1 (Glasgow, 1899)
- IGCH:** M. Thompson, O. Mørkholm, and C. Kraay, eds., *An Inventory of Greek Coin Hoards* (New York, 1973)
- Jameson:** R. Jameson, *Collection R. Jameson, monnaies grecques antiques*, vol. 1 (Paris, 1913)
- Locker Lampson:** E. S. G. Robinson, *Catalogue of Ancient Greek Coins Collected by Godfrey Locker Lampson* (London, 1923)
- de Luynes:** J. Babelon, *Catalogue de la collection de Luynes*, vol. 1 (Paris, 1924)
- Marseilles:** C. Brenot and A. Sias, *Catalogue du Fonds Général (Marseilles, la Sicilie, et la Grande Grèce); Archives de la Ville de Marseilles, Cabinet des Medailles* (Marseilles, 1981)
- McClean:** S. W. Grose, *Catalogue of the McClean Collection of Greek Coins*, vol. 1 (Cambridge, Eng., 1923)
- MFA:** A. B. Brett, *Catalogue of Greek Coins, Museum of Fine Arts* (Boston, 1955)
- MFA²:** M. Comstock and C. Vermeule, *Greek Coins, 1950 to 1963* (Boston, 1964)
- Molthein:** U. von Remer, *Catalogue de la collection des médailles grecques de L. Walcher de Molthein* (Paris, 1895)
- Morgan:** W. Raymond and S. P. Noe, *The J. Pierpont Morgan Collection* (New York, 1953)
- Nanteuil:** H. de Nanteuil, *Catalogue de monnaies grecques* (Paris, 1925)
- NCirc:** *Numismatic Circular*. Spink and Son, Ltd. (London)

- Pachino: A. di Vita, "Pachino-Tesoretto monetale del IV-III sec. A. C. Rinvenuto in contrada coste 'Fondovira'," *AIIN* 5-6 (1958/9) pp. 125-65
- Sartiges*: Vicomte de Sartiges, *Collection du Vicomte de Sartiges; séries grecques et romaine* (Paris, 1912)
- SNG*: *Sylloge Nummorum Graecorum*
- SNGAarhus*: *SNG Aarhus University, Denmark* (Copenhagen, 1986)
- SNGANS*: *SNG American Numismatic Society*, pt. 5 *Sicily III: Syracuse-Siceliotes* (New York, 1988)
- SNGAshm*: *SNG [Great Britain]* vol. 5, pt. 2, *The Ashmolean Museum, Oxford* (London, 1969)
- SNGCop*: *SNG The Royal Collection of Coins and Medals, Danish National Museum, Sicily*, pt. 2 (Copenhagen, 1942)
- SNGDavis*: *SN G [Great Britain]* vol. 1, pt. 2, *The Newnham Davis Coins in the Wilson Collection of Classical and Eastern Antiquities, Marischal College, Aberdeen* (London, 1936)
- SNGDelepierre*: *SNG France, Bibliothèque Nationale, Paris: Collection Jean et Marie Delepierre* (Paris, 1983)
- SNGDreer*: *SNG Austria*, vol. 1: *Sammlung Dreer, Klagenfurt im Landesmuseum für Kärnten* (Klagenfurt, 1967)
- SNGFabricius*: *SNG The Fabricius Collection, Aarhus University, Denmark, and the Royal Collection of Coins and Medals, Danish National Museum, Copenhagen* (Copenhagen, 1987)
- SNGFitz*: *SNG [Great Britain]* vol. 4, pt. 2, *The Fitzwilliam Museum: Leake and General Collections* (London, 1947)
- SNGHart*: *SNG [Great Britain]* vol. 8, *The Hart Collection, Blackburn Museum* (London, 1989)
- SNGLewis*: *SNG [Great Britain]* vol. 6, *The Lewis Collection in Corpus Christi College, Cambridge* (London, 1972)
- SNGLloyd*: *SNG [Great Britain]* vol. 2, pts. 7-8, *The Lloyd Collection* (London, 1937)
- SNGLockett*: *SNG [Great Britain]* vol. 3, pt. 2, *The Lockett Collection* (London, 1939)
- SNGManchester*: *SNG [Great Britain]* vol. 7, *Manchester University Museum* (London, 1986)
- SNGMunich*: *SNG Deutschland: Staatliche Münzsammlung München*, pt. 5 (Berlin, 1977)

- SNGSalting: SNG [Great Britain] vol. 1, pt. 1, The Salting Collection, Victoria and Albert Museum (London, 1931)*
- SNGSpencer-Churchill: SNG [Great Britain] vol. 1, pt. 1, The Collection of Capt. E. G. Spencer-Churchill, M. C., of Northwick Park (London, 1931)*
- SNGSwed: SNG Sweden, vol. 1, The Collection of His Late Majesty Gustaf VI Adolf and the Fred Forbat Collection (Stockholm, 1974)*
- SNGTübingen: SNG Deutschland: Münzsammlung der Universität Tübingen, vol. 1 (Berlin, 1981)*
- Ward: G. F. Hill, Descriptive Catalogue of Ancient Greek Coins Belonging to John Ward, F.S.A. (London, 1901)*
- Warren: K. Regling, Die griechische Münzen der Sammlung Warren (Berlin, 1906)*
- Weber: L. Forrer, The Weber Collection, vol. 1 (London, 1922)*
- Wheaton: J. D. Bishop and R. R. Holloway, Wheaton College Collection of Greek and Roman Coins (New York, 1981)*
- Woodward: E. S. G. Robinson, Ancient Greek Coins in the Possession of William Harrison Woodward, a Catalogue (Oxford, 1928)*
- Wulfig: K. Herbert, The John Max Wulfig Collection in Washington University (New York, 1979)*

3. Sale Catalogues

- ANA: American Numismatic Association
- Auctiones A. G.: Auctiones A. G., Basel
- Ball: Robert Ball Nachf., Berlin
- Baranowsky: M. Baranowsky, Milan
- Barcelona ANE: Asociacion Numismatica Española, Barcelona
- Basel: Münzhandlung Basel, Basel
- Bolender: M. H. Bollender, San Marino, California
- Bourgey: E. Bourgey, Paris
- Bowers & Merena: Bowers & Merena, Wolfeboro, New Hampshire
- Button: E. Button, Frankfurt (continued as Frankfurter)
- Cahn: A. E. Cahn, Frankfurt am Main
- Calico: X and F. Calico, Barcelona
- Canessa: E. and A. Canessa, Naples
- Caprotti: Caprotti, Milan

Christensen: H. Christensen, Hoboken, New Jersey
Ciani: L. Ciani, Paris
Ciani-Vinchon: P. Ciani-J. Vinchon, Paris
Coin Galleries: Coin Galleries, New York
Delaune: R. Delaune, Paris
Delmonte: A. Delmonte, Brussels
de Nicola: L. de Nicola, Rome
Dorotheum: Dorotheum, Vienna
Dupriez: C. Dupriez, Brussels
Egger: Brüder Egger, Vienna
de Falco: Numismatica Giuseppe de Falco, Naples
Feuardent: Feuardent Frères, Paris
Florange: J. Florange & L. Ciani, Paris
Frankfurter: Frankfurter Münzhandlung, Frankfurt am Main
Frey: H. P. Frey, Freiburg
Gans: E. Gans, Berkeley, California
Gibbons: Stanley Gibbons, London
Glendining: Glendining and Co., London
Grabow: L. Grabow, Rostock
Hamburger: L. Hamburger, Frankfurt am Main
Hamburger, J.: J. Hamburger, Frankfurt am Main
Helbing: O. Helbing Nachf., Munich
Hesperia: Hesperia Art, Philadelphia, Pennsylvania
Hess: A. Hess Nachf., Frankfurt am Main
Hess-Leu: A. Hess, Lucerne-Bank Leu, Zurich
Hirsch: J. Hirsch, Munich
Hirsch, G.: G. Hirsch, Munich
Hoffmann: M. H. Hoffmann, Paris
Kelly: James Kelly, Dayton, Ohio
Knobloch: Frederick S. Knobloch, Bronx, New York
Kovacs: Frank L. Kovacs, San Mateo, California
Kress: K. Kress, Munich
Kricheldorf: H. H. Kricheldorf, Stuttgart
Lee: M. G. Lee, Cairo
Lempertz: Math. Lempertz, Cologne
Leu: Bank Leu A. G., Zurich
Leu-Münz. u. Med.: Bank Leu A. G., Zurich-Münzen und Medaillen
A. G., Basel

McSorley: Charles McSorley, New York
 Malloy: A. G. Malloy, Inc., South Salem, N.Y.
 Malter: Joel Malter, Encino, California
 Merzbacher: E. Merzbacher Nachf., Munich
 Morgenthau: J. C. Morgenthau & Co., New York
 Münz. u. Med.: Münzen und Medaillen A. G., Basel
 Myers: R. J. Myers, New York
 Naville: Naville et Cie., Geneva
 New England: New England Rare Coin Auctions, Boston
 NFA: Numismatic Fine Arts, Beverly Hills, California
 Parke-Bernet: Parke-Bernet Galleries, Inc., New York
 Peus: B. Peus, Frankfurt am Main
 Platt: C. Platt, Paris
 Platt, M.: Marcel Platt, Paris
 Rasmussen: A. Bruun Rasmussen, Copenhagen
 Ratto: R. Ratto, Lugano
 Raymond: Wayte Raymond, Inc., New York
 Riechmann: A. Riechmann & Co., Halle
 Rollin-Feuardent: Rollin et Feuardent, Paris
 Rosenberg: S. Rosenberg, Frankfurt am Main
 Roy's: Roy's Coin Center, Inc., San Antonio, Texas
 Salton-Schlessinger: M. M. Salton-Schlessinger, New York
 Sambon: A. Sambon, Paris
 Sambon-Canessa: A. Sambon-E. Canessa, Paris-Rome
 Sangiorgi: G. Sangiorgi, Rome
 Santamaria: P. & P. Santamaria, Rome
 SB Zurich: Schweizerischer Bankverein, Zurich
 Schlessinger: F. Schlessinger, Berlin
 Schulman: J. Schulman, Amsterdam
 Schulman, H.: H. Schulman, New York
 SK Bern: Schweizerische Kreditanstalt, Bern
 Seaby: B. A. Seaby, Ltd., London
 Serrure: R. Serrure, Paris
 Sotheby: Sotheby & Co., London
 Stack's: Stack's, New York
 Sternberg: F. Sternberg, Zurich
 Superior: Superior Stamp and Coin Co., Beverly Hills, California
 Vinchon: J. Vinchon, Paris

THE “VICTORY” DRACHMS OF PHRAATES IV

(PLATE 12)

DAVID SELLWOOD

As is well known, any attempt to write the history of the Parthian empire must be based largely on the surviving coinage of its ruling dynasty, the Arsacids. The numismatic information, combined with archaeological evidence and the often incomplete records of contemporary Greeks and Romans, was used magisterially by David Bivar in the *Cambridge History of Iran*.¹ I would like here to acknowledge the great help I have received over many years, not merely from his valuable papers and articles, but, even more enjoyably, from personal discussions with him. My debt will become obvious in the ensuing paragraphs.

The favorite son of Orodes II was Pacorus I, who apparently reigned as a joint king until he perished in a Roman ambush. This loss was fatal to Orodes who either died of grief or, more probably in view of what followed, was murdered by the next-in-line, Phraates IV. The latter ascended the throne ca. 38 B.C. and consolidated his position by the wholesale slaughter of his brothers and their families. Mark Antony, eager to avenge the disaster of Crassus at Carrhae some two decades earlier, now invaded Mesopotamia with a Roman army but nearly suffered the same fate as his predecessor. Despite this victory, Phraates' "harsh disposition quickly gave rise to dissension among his

¹ A. D. H. Bivar, "The Political History of Iran under the Arsacids," in *The Cambridge History of Iran*, vol. 3 (1) (Cambridge, Eng., 1983), pp. 21–99.

own subjects," to quote Bivar's words on the subject.² In consequence, Antony became emboldened enough to invade again in 34 B.C., but only got as far as Armenia whose king, Artavasdes, he took prisoner. The festering quarrel with Octavian caused Antony to withdraw again to the west where he died after the battle of Actium in 31 B.C. Arsacid control of Armenia was of course re-established, and in the wake of this fortuitous triumph Phraates' conduct became so unbearable to the nobility that a spontaneous rebellion drove him from the throne. To reclaim it, he sought assistance from Scythian tribesmen, themselves of the same blood as the Arsacids but emanating from beyond the boundaries of the Parthian empire. In the interim, power had been seized by a certain Tiridates of unknown antecedents but bearing an authentically Arsacid name. At the approach of the royal contingents the usurper fled to Augustus (as Octavian was now called) along with Phraates' son who had been somehow kidnapped. The Roman emperor acceded to Phraates' request for the return of the child but continued to protect Tiridates, who gathered sufficient support to make another attempt on the kingdom, occupying the winter capital, Seleucia-on-the-Tigris, for a few months. Although we have no literary evidence regarding Tiridates' fate, it is clear that Phraates soon overcame this threat and resumed his rule, this time permanently.

Starting towards the end of the reign of Orodes II and thenceforward down to the collapse of the dynasty, Parthian tetradrachms, all of which were struck at Seleucia, carried both year and month dates while the legend was effectively standardized. Phraates' large silver coins follow this pattern, but the chief distinctive feature of his numismatic portrait is the presence on his brow of a wart, a genetic inheritance from Orodes and, for more than a century subsequently, a guarantee of Arsacid descent. A small group of coins from the period under discussion is notable first, as having a royal effigy without the wart, and second, as bearing the unusual epithet ΦΙΛΟΡΟΜΑΙΟΥ (friend of the Romans), clearly inappropriate for Phraates; with obvious justification these have long been attributed to Tiridates. B. Simonetta was the first to remark that a slightly earlier series of the

² Bivar (above, n. 1), p. 64.

same denomination also has portraits which consistently omit the wart.³ He drew the fully warranted conclusion that, although they have the same inscription as the issues of Phraates, they should also be assigned to Tiridates. The sequence of coins from the latest specimen of Phraates before the advent of Tiridates until the uninterrupted recommencement of his rule runs as follows.

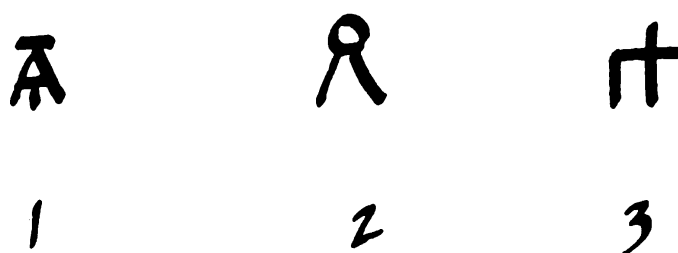
MONARCH	SELEUCID ERA	DATE	B.C.
Phraates	Hyperberetaeos	283	September 29
Tiridates	Peritios	284	January 28
Tiridates	Dystros	284	February 28
Tiridates	Xandicos	285	March 27
Tiridates	Artemisios	285	April 27
Tiridates	Daesios	285	May 27
Phraates	?	285	28/27
Phraates	Dios	286	October 27
Phraates	Apellaeos	286	November 27
Phraates	Dystros	286	February 26
Tiridates	Xandicos	286	March 26
Tiridates	Artemisios	286	April 26
Tiridates	Daesios	286	May 26
Phraates	Gorpiaeos	286	August 26

The conversions from Seleucid Era dates to those of the Christian Era have been calculated assuming for the former a Dios (October) start to the year. It should be noted that the assumption of a Daesios (May) start would have entailed long gaps in the continuity of Tiridates' issues in 27 and 26 B.C.; furthermore no account has been taken of the consequences of the possible occurrence (not known from the extant coins) of the intercalary month Embolimos. In any case the table shows satisfactorily the two periods of occupation of Seleucia by Tiridates, the first of a minimum of fifteen months, the second of three.

As distinct from the tetradrachms, very few Parthian drachms carry dates and none of those of the period under discussion do so. On the other hand they bear one of a series of monograms which are presumed to indicate the mints at which they were struck, most of them lying on

³ B. Simonetta, "Sulla monetazione di Fraate IV e di Tiridate II di Parthia," *RIN* 78 (1976), pp. 19-34.

the plateau of Iran where this denomination circulated. As a result we may attempt to locate them geographically, but can only do so chronologically by comparison with the larger silver and with ascertained historical facts. Employing these two criteria, let us now examine the specimens illustrated on Plate 12.



The first six examples probably come from Ecbatana or Agbatana, the modern Hamadan, denoted by monogram 1 in the Figure. Coin 1 depicts Pacorus I, beardless and with a Nike flying behind his head preparing to adorn him with a wreath or diadem. (These coins are very rare and the one in the plate is in fact a forgery, but it does give us in correct detail the essential elements of the design.) Drachm 2 belongs to the earliest issue of Phraates IV. The new monarch is portrayed fully bearded and wearing, in addition to the elaborately ornamented kandys, a segmented necklet (not the spiral torque habitually worn by Arsacid rulers). Importantly, he has on his forehead the wart that characterizes his tetradrachms. These issues, too, are far from common. The third coin is effectively the same as 2, but it carries behind the royal head a flying eagle, wreath in beak. This symbol became the hallmark of Phraates' subsequent drachm issues, which as far as Ecbatana is concerned are very plentiful. Following a custom developed during the reign of Orodes II, father of Phraates, the latter's mint bureaucracy instituted a system of increasingly complex symbols to differentiate between successive groups of strikings. Thus specimen 4 has an additional eagle behind the enthroned figure on the reverse. Similarly, the next example, 5, introduces a star in front of the obverse bust and another one replaces the eagle on the reverse. The last coin in this series, 6, omits the star on the reverse but adds a crescent below the star on the obverse. It may be noted that there is engraver continuity between this group and the issues of Phraates' son and successor, Phraataces.

Although, naturally, there were local variations, the mints of the other cities of Iran proper tended to follow the example of Ecbatana. Thus at the center identified by monogram 2 (probably Laodicea, the modern Nihavand) the same multiplication of subordinate emblems applies. For drachm 7, in addition to the eagle there is a star on both faces, although that of the obverse is only lightly struck. The next piece, 8, hitherto unpublished, is interesting on two counts. First, it comes from the same reverse die as 7, with which it is accordingly taken to be contemporary; in fact, the differing progress of die flaws implies that 8 is the earlier striking. Second, on the new obverse, while the royal brow continues to display the wart, no star at all is evident and the eagle is replaced by a Nike, as on the coinage of Pacorus I; we shall discuss the significance of this below.

The next pair of coins, 9 and 10, demonstrate the same relationship. They emanate from a mint represented by monogram 3 (probably Rhagae, now a suburb of Tehran). In addition to the "standard" eagle, the first carries a star on obverse and reverse, which is noteworthy for the ridiculous, upward staring posture of the enthroned figure as well as for the unbelievably blundered legend. The second has an almost identical reverse, although it is not from the same die; its obverse is of a somewhat different style from its companion piece, but yet shows the wart, while it omits the star and again replaces the eagle by a Nike.

Previous students have assumed that the standard issues of Phraates IV are to be arranged in the order given above, based on the progression from eagle alone to eagle, star, and crescent. It seems clear that the rare group without symbol should come before these others. However that with Nike presents more of a difficulty. Because it seems that the very first issue of Orodes II is distinguished by this "flying Victory" and that, as we have remarked, the drachms of Pacorus I carry her too, it was logical to place the coins of Phraates under consideration here at the head of his series, marking his accession as Nike had done for his father and brother. Now, of course, the die linked examples 7 and 8, as well as the close similarities between the reverse dies of 9 and 10, oblige us to locate the "Nike" drachms part way through his reign. Such being the case, it would be almost perverse not to connect them with the events surrounding the usurpa-

tion of Tiridates. Just as the Orodes class may refer to the demise of his rebellious brother Mithradates and the Pacorus examples perhaps celebrate his success against the Romans, so the present group, struck after the final withdrawal of the pretender, could represent a triumphal issue for Phraates IV.

A further recently discovered drachm, 11, belongs to the same group as 9, struck probably at Rhagae. However, its inscription is much more correctly engraved, and this is often taken to imply an earlier position in the series. Moreover, the obverse lacks the eagle behind the head. A section of the original die has been chiselled away in the appropriate place leaving a raised area with just the trace of the bird's feet below. To go further in attempting to erase the forehead wart or the necklet would have been technically much more difficult without unacceptable mutilation of the portrait and so these features remain. In any case they are much less immediately distinctive characteristics of Phraates' issues than is the eagle. We have no reason to suppose that this prince could have had a motive for defacing his own dies, but any opponent would. Usurpers throughout history have always tried, where possible, to strike money which would be seen by its users as promoting a new claim to power, and we have already discussed Tiridates' issues from Seleucia. When Phraates withdrew to obtain Scythian assistance, Tiridates or his supporters had an opportunity briefly to move up onto the plateau where drachms were produced from this hurriedly altered die. Such specimens, actually re-engraved after striking or coming from modified dies, occur at all stages of the Arsacid period.⁴

If these hypotheses are correct (and it must be stressed that they are not proven) it becomes possible to put tentative dates to the series of Phraates' drachm issues in Iran.⁵

⁴ Some are described in D. G. Sellwood, "Some Politic Alterations in the Parthian Series," in *Mints, Dies and Currency. Essays Dedicated to the Memory of Albert Baldwin*, ed. R. A. G. Carson (London, 1971), pp. 33-37.

⁵ References are to D. Sellwood, *An Introduction to the Coinage of Parthia*, 2nd ed. (London, 1980).

TYPE	DESCRIPTION	APROX. DATE B.C.	PLATE 12	REFERENCE
1	No symbols (very rare)	38	2	51.44
2	Eagle on obv., no rev. symbol (very common)	38-33	3	52.10
3	Eagle on obv. and rev. (common)	33-30	4	52.36
4	Eagle and star on obv., star on rev. (common)	30-24	5 7 9	53.3 53.4 53.5
5	Eagle erased on type 4 (Tiridates?) (unique?)	28	11	—
6	Nike on obv., star on rev. (very rare)	25	8 10	— 50.15
7	Eagle, star and crescent on obv., no rev. symbol (common)	24-2	6	54.7

Since this article was written, Dr. F. de Callatay has reported on the contents of a hoard containing a large number of tetradrachms of the period under discussion. In particular he rejects the late Prof. Bono Simonetta's reattribution of those tetradrachms lacking the wart on the royal forehead to Tiridates and has gone back to the earlier theory that, except for the specimens reading ΦΙΛΟΠΟΜΑΙΟΥ, they were all struck by Phraates. One of the main reasons cited is the following. If the presence of the wart was intended to have the significance of proving descent in the Arsacid line, then any usurper, such as Tiridates, would naturally adopt it. Hence the fact that some types of the tetradrachm omit the wart is fortuitous, perhaps an engraver idiosyncrasy.

However, in the Parthian coinage, the wart only appears with the later issues of Orodes II, father of Phraates. Nowhere do we have any evidence that Tiridates too claimed to be son of Orodes. Accordingly, by not having a wart on his portrait he would be deliberately emphasizing that he was not descended from Orodes, unlike Phraates, whom Tiridates opposed. This leads me to believe that Simonetta's differentiation, the basis of the chronological table above, is still valid.

COUNTERMARKED CHARACENE TETRADRACHMS OF ATTAMBELOS IV

(PLATES 13-14)

ED DOBBINS

For over three centuries, the kingdom of Characene, located at the head of the Persian Gulf near the mouth of the Tigris River, served as a trading center for goods enroute between the Far East and the Roman Empire.¹ Because few contemporary accounts of the area have survived, historical reconstruction of the kingdom has relied largely upon numismatic evidence. Coins were issued in Characene from the time of the kingdom's founder, Hyspaosines, around 125 B.C., to the Sasanian conquest in A.D. 228. The coinage included silver tetradrachms, which were progressively debased to bronze by the middle of the first century A.D., and fractions in silver, bronze, and lead. Although recent hoard evidence has filled in a number of gaps, the Characene king list still contains a number of controversial attributions and long periods for which coinage is unknown (Appendix).

A large gap in the Characene coin series occurs in the second half of the first century A.D. Between 53 and 72 a ruler identified in the British Museum catalogue as Attambelos III issued bronze tetradrachms.² The next coin-issuing king in that catalogue, also named

¹ For the location and early history of the city of Charax Spanisou, see J. Hansman, "Charax and the Karkeh," *Iranica Ant.* 7 (1967), pp. 21-58.

² *BMCarabia*, pp. cci, 296-98.

Attambelos, does not appear until 103. A second gap occurs from 113 to 142 between the reigns of Theonesos III and Meredates.

Based upon discoveries made at Susa and reanalysis of coins at the Bibliothèque Nationale in Paris, G. Le Rider added another king to the first century A.D. Attambelos line.³ The existence of this newly identified king, Attambelos III, has been supported by recent evidence (Plate 13, 1).⁴ Coins formerly attributed to the king known in *BMC Arabia* as Attambelos III are now ascribed to Attambelos IV and date from 53 to 64. A single coin dated 72/3 was attributed by Le Rider to another new king whom he designated Attambelos V.

This paper analyzes a hoard of 272 bronze Characene tetradrachms which date between 53 and 112 (365 to 423 S.E.). Most of the coins in this group have at least one of six different countermarks. Similar coins portraying countermarks have previously appeared in the plates of various publications but have seldom been remarked upon.

Very few details are available on the background of the hoard reported here. It was said to have been brought into the United States from an unknown location in the Middle East sometime in the late 1960s or early 1970s. Although portions of the hoard have appeared on the market in the past two decades, the bulk resided in a coin dealer's vault for over 20 years until 1992.⁵

One published hoard of Characene tetradrachms shares a number of characteristics with the large lot analyzed here. In 1878, at Telloh (ancient Girsu) in Iraq, Ernest de Sarzec reported a group of 732 bronze tetradrachms found in a pottery vessel.⁶ Most of the coins in the hoard were countermarked and attributable to the ruler currently known as Attambelos IV. Waddington selected 95 of the coins for his personal collection and later donated them to the Bibliothèque Natio-

³ G. Le Rider, "Monnaies de Characene," *Syria* 36 (1959), pp. 229-53.

⁴ D. T. Potts, "Arabia and the Kingdom of Characene," in *Araby the Blest*, ed. D. T. Potts (Copenhagen, 1988), pp. 137-67; D. T. Potts, *The Arabian Gulf in Antiquity*, volume 2 (Oxford, 1990), p. 291; E. Dobbins, "Two New Dates on Characene Coins," *ONSN* 137 (Summer 1993), p. [6]. The coin of Plate 13, 1, was originally published here.

⁵ Personal communication, Nicholas Economopoulos, 1993.

⁶ E. de Sarzec, *Découvertes en Chaldée* (Paris, 1912), pp. 49-50; A. Parrot, *Tello* (Paris, 1948), pp. 310-13.

nale in Paris.⁷ A few of these coins were briefly described and illustrated by E. Babelon in 1898.⁸ The location of the remaining 600 plus coins from the Telloh hoard is unknown.

THE COINS

Of the 272 coins in the new hoard, 267 may be attributed to Attambelos IV and dated between 365 and 375 S.E. (A.D. 53 and 64). At least one example of each year except 367 was present. A single coin dated 415 S.E. (A.D. 103) can be assigned to Attambelos VI. Four coins belong to Theonesos III and date to 422 or 423 S.E. (A.D. 110-12). Two of the Theonesos coins and all of the Attambelos IV coins have one to four countermarks on their obverses. The coins are heavily worn.

The weights, diameters, and die axes of the coins are within the parameters described for the series in *BMCArabia*. The weights range between 12.2 and 16.0 g with a mean of 14.8 g. Diameter size varies from 22 to 28 mm with an average of slightly over 25 mm. Die axis is most often at 12:00 and consistently falls within the 11:00 to 1:00 range.

The obverse portrays a diademed bust right in a beaded border. The diadem is tied in a loop at the back of the head, and the ends of the ties fall down and away from the neck. The hair on the bust is depicted in wide, loose curls that vary from six to eight in number. Differences in the number of curls appear to be the result of die variation rather than a stylistic marker which changed through time.

On the reverse is a diademed Heracles seated on an omphalos and holding a club. In two lines to either side of Heracles is a legend which, in full, probably reads: **BACIAEWC/ATTAMBHAOV/CWTHPOC/KAIEVEPTETOY**. The legend does not appear in its entirety on any coin. Typically, only portions of the **ATTAMBHAOV** and

⁷ E. Babelon, "Sur la Numismatique et la Chronologie des Dynastes de la Charracene," *JIAN* 1 (1988), pp. 381-404; F. M. Allotte de la Fuÿe, "Les Monnaies de l'Élymaïde," *RN* 22n (1919), p. 24. The coins of Attambelos IV and later kings which Le Rider reanalyzed in 1959 were probably from the Telloh hoard.

⁸ Babelon (above, n. 7), p. 392.

CWTHPOC sections of the legends are visible. Slight changes in letter forms can be observed on coins of various years. For example, the **A** on early coins was usually written with a horizontal crossbar which changes to a "V" shape crossbar in later years.

In the exergue, the Seleucid Era date in Greek numerals reads left to right.⁹ Other devices which appear on the reverse include a monogram before Heracles' face and a symbol, usually either a Greek or Aramaic letter, underneath the arm. Coins minted in the year 466 S.E. often have a third symbol consisting of two circles connected by a line before Heracles' knee.

The coins of Attambelos IV present two varieties of obverse portraits and two varieties of seated Heracles reverses.

The earlier of the two obverse varieties portrays a beardless bust (Plate 13, 2). Flan diameters of this variety tend to be slightly larger and often measure around 26 mm. Due to the larger diameter, reverse legends are usually somewhat more complete than on tetradrachms minted later in the series. The beardless portraits were issued from 365 to 370 S.E. A total of 55 examples were contained in the group.

The second, and later, variety of obverse portrait depicts a bearded ruler (Plate 13, 3). Portraits with very short beards began to be issued sometime during the year 370. By 371 and continuing to the end of the series in 375 the beard became slightly fuller and approximately medium in length. The beard does not appear to vary in a regular fashion between the years 372 and 375 S.E., so that coins cannot be assigned to specific mint years based solely on the criterion of beard length or fullness.

The first of the two reverse varieties shows the seated Heracles holding a club upright in his extended right arm (Plate 13, 4). The variety 1 reverse occurs on every year of issue with the possible exception of 373 S.E., a year for which no reverses of this type are known either in this group or in the published literature.

⁹ The Seleucid Era dates employed in the analysis portion of this paper are reckoned from a beginning date of autumn 312 B.C. O. Mørkholm, "A Hoard of Coins from Characene," *Coin Hoards* 4 (1978), pp. 25-27; G. Le Rider, *Suse sous les Séleucides et les Parthes* (Paris, 1965), pp. 40-41.

The second reverse variety shows Heracles holding the club downward with his left arm (Plate 13, 5). Heracles' right arm remains extended but his hand is empty. The variety 2 reverse appears only in the years 372 and 373, the transition occurring sometime during the year 372. Coins in the remaining two years of the series, 374 and 375, again depict the variety 1 reverse. There are 35 examples of the variety 2 reverse in the group.

The exergue dates were rarely present or readable on the coins of this hoard due to smallish flans, crude striking, and wear. Only 42 of the Attambelos IV coins carried enough of the three digit date to be decipherable. A die study of the dated coins produced unsatisfactory results, as there appeared to be examples of a great number of both obverse and reverse dies. Fewer than 20 die linked coins could be identified.

REVERSE SYMBOLS

An alternative method of dating was devised using the monograms in front of Heracles' face on the reverse of the coins. Monograms in this location began to appear regularly during the reign of Tiraïos II, 79/8 to 49/8 B.C.¹⁰ Recent hoards containing coins of Tiraïos II, Attambelos I, and Theonesios I have provided long and fairly complete sequences of monograms for these rulers,¹¹ which have the following characteristics: 1) monograms appear on coins for a variable number of years; 2) once a monogram disappears, it does not recur on later coins; 3) monograms may change during the minting year or between two years; and 4) monograms change during a ruler's reign but the same monogram may be carried over from one ruler to the next. The monogram has been interpreted as the symbol of the mint magistrate.¹²

¹⁰ Le Rider (above, n. 3), p. 243.

¹¹ Le Rider (above, n. 3), pp. 240–50; Mørkholm (above, n. 9), p. 26; H. Nicolet-Pierre, "Theonèsis, Roi de Characène," *RN* 20 (1978), pp. 46–55.

¹² G. F. Hill, *Attambelos I of Characene*, *ANSNM* 14 (New York, 1922).

TABLE 1

Reverse and Obverse Monograms/Symbols

1 	2 	3 	4 
5 	6 	7 	8 
9 	10 	11 	12 
13 	14 	15 	16 
17 	18 	19 	

The 14 varieties of reverse monograms found in the hoard are given in Table 1, 1–14. In Table 2, these monograms are correlated to coins with legible dates and/or other characteristics, such as presence/absence of a beard and reverse variety, which allow for more specific dating within the eleven year minting period. No clear examples of reverse monograms were found for 365, 368, or 373 S.E. with a variety 1 reverse. Monograms were correlated to 372 S.E. coins with a variety 1 reverse on the basis of similar monograms on that year's variety in 2 reverses.¹³

¹³ For an example of a coin dated 372 S.E. with a variety 1 reverse, see *BMC Arabia*, pl. XLIV, 2. The reverse monogram is only partially visible on the BM coin, but is consistent with the monogram assigned to the type discussed here.

TABLE 2

Monograms by Year
























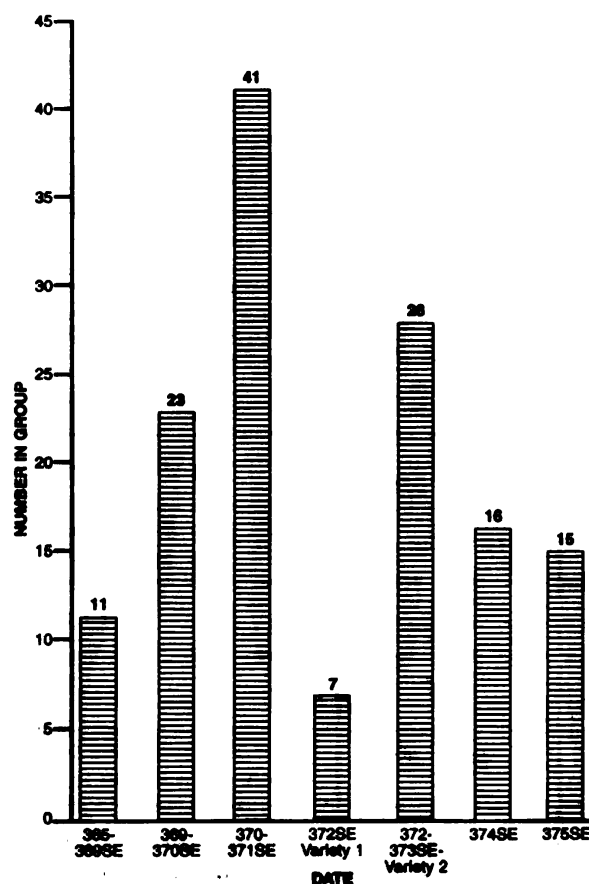
Seleucid Era Date	Monogram	Comments
365		None in group with legible monogram
366		⌀ before leg
367		
368		None in group
365-368	 , 	Last digit if date not visible
369	 , 	
370	 , 	Beardless
370	 , 	Bearded
371	 , 	
372	 , 	Variety #1 reverse. See BMC plate XLIV, 2
372	 , 	Variety #2 reverse
373	 , 	Variety #2 reverse
373		Variety #1 reverse, none in group, uncertain if exists
374		
375		
Undated #1	 , 	Uncertain symbol on obverse, monogram similar to 370/371SE
Undated #2		Uncertain if Attambelos IV

Table 2 demonstrates that the important characteristics exhibited by monograms on early Characene coins also applied to the coins of Attambelos IV. An important additional characteristic is that the monograms often had two forms, each the reverse or mirror image of the other. The reversal may involve the entire monogram, as in the years 365 through 368 S.E., or be confined to only a portion of the monogram, as for 369 and 370 S.E. The dominance of one variation in each monogram pair suggests the reversals resulted from die cutting errors. Alternate forms of monograms have, therefore, been treated as equivalent. A total of seven monograms appear to have been employed over the eleven year minting period. Examples are given in Plate 13, 6-12.

TABLE 3

Frequency of Coins by Date



Using monogram sequencing as the primary dating criterion, 141 of the 267 Attambelos IV coins in the hoard could be assigned to time periods ranging from one to four years in length (Table 3). Monograms on most of the remaining coins could not be reliably identified and were assigned time periods based on the presence of either a beardless or bearded obverse portrait.

Four coins have clearly readable monograms which could not be assigned dates (Table 2, undated 1 and 2). Each of the coins has a bearded obverse portrait suggesting a date of 370 S.E. or later. One of the three coins included in undated 1 has a partial date of 37?, which indicates the coin belongs in the Attambelos IV sequence. The similarity of this monogram to those found on the years 370 and 371 suggests undated 1 may be an alternate form of the monogram used in these two years.

Undated 2 is a single coin struck with the exergue off the flan. Although the obverse portrait is bearded, this coin cannot be attributed with certainty to Attambelos IV and may belong to a later Attambelos.

Table 4

Underarm Letters/Symbols

1 X	2 I	3 Y	4 A
5 Π	6 O	7 B	8 Σ
9 J	10 T	11 κ	12 M
13 V	14 C	15 Δ	16 λ

A second symbol on the reverse of the coins occurs in the area beneath Heracles' arm. In this hoard 16 different symbols were found, (see Table 4). The symbols appear to be letters in either Greek or local Aramaic script. Such letters began to appear sporadically on Characene coinage during the reign of Attambelos I (47/6 to 25/4 B.C.) and became a standard feature on the coinage during the time of Attambelos II (18/7 B.C. to A.D. 7/8). Table 5 compares the range of underarm symbols found on the coins of six Characene rulers and suggests that the greatest variety of symbols occurs on the coins of Attambelos IV.¹⁴ Some of the symbols found on his coins also appear on the issues of both earlier and later rulers.

TABLE 5

Underarm Symbols on Coins of Characene

	Letter/Symbol															
	X	I	Y	A	η	ο	Β(Ϟ)	Ϛ	Ι	Τ	Χ	Μ	Υ	Ϛ	Ϟ	ϙ
Attambelos I	+				+							+			+	+
Theonesos I	+				+				+	+						
Attambelos II			+						+							+
Attambelos III	+					+	+								+	+
Attambelos IV	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Theonesos III	+				+											+

+ = present on published coins

¹⁴ *BMC Arabia*, pp. 291–300; Hill (above, n. 12), pp. 4–5; Le Rider (above, n. 9), pls. 36–37; Mørkholm (above, n. 9), p. 27 Fig. 11; Nicolet-Pierre (above, n. 11), pp. 49–54, pl. 3–5; H. G. Oldenburg 26, 1 Nov. 1991, 358–61.

The function of the symbols is unknown. G. F. Hill remarked that they "could not represent months as they ran to X."¹⁵ Another function which may be eliminated is personal workers' marks, as the symbols recur over a 150 year period. They also do not appear to have served as die markers, since the reverses of the coins in this study having the same symbol in the same year were rarely die linked.

TABLE 6

Underarm Symbols by Date

Seleucid Era Date	Letter/Symbol																Number in Group
	X	I	Y	A	Π	O	Β(Ε)	ζ	Ι	Τ	κ	Μ	Υ	Ϸ	Δ	Λ	
365-368	+	+	+	+	+												7
369-370 beardless	+	+	+		+	+					+					+	16
370-371 bearded	+	+	+	+	+	+	+	+				+	+				38
372-373	+	?	+		+	+	+	+	+	+					+	+	31
374					+	+	+		+	+							15
375		?			+		+			+					?	?	14
Number in Group	10	8	16	7	18	13	12	6	5	9	7	1	1	4	4	4	121

+ = present on published coins

Table 6 lists the 16 varieties of symbols found in the hoard by date. Only one of the symbols appears to have been utilized for the entire series. Letters which appeared early in the sequence are discontinued and replaced by different symbols. This pattern argues against another possible function of the letters, that they were used as sequencing designations within the series or within a given year or monogram period.

¹⁵ Hill (above, n. 12), p. 11.

Assuming the sample in the hoard reflects the variety of symbols actually used, a reasonable hypothesis is that the symbols may have represented workstations within the mint. This would account for the reuse of the same symbols over a number of years and for the varying number of symbols in use at different times. New symbols could have been added whenever a new workstation was created and lasted as long as coins were minted at that station. An attractive consequence of this interpretation is that production of the mint can be viewed as a function of the number of workstations or symbols which appear on the coins in a given time period. The years with the largest number of symbols and, hence, most workstations and highest mint output would have been 370 through 373 S.E.

OBVERSE SYMBOLS

There are five different symbols which appear on the obverses of Attambelos IV coins, Table 1, 15–19. The devices are confined to coins which have a bearded bust and date from 370 to 375 S.E. In the years with coins bearing a symbol, there are also coins without a symbol.

In the years 370 and 371, a palm branch¹⁶ occurs before the bust on some coins (Table 1, 16; Plate 14, 13). A similar device reappears on the coins of Theonesos III in the early second century. In the hoard there was a palm on one coin dated 370, and on 14 coins dated 371.

The second symbol, a crescent located behind the head, occurs on three of the coins with a palm. Three other coins also dated to 370 or 371 carry a crescent behind the head but no palm before the bust (Table 1, 15; Plate 13, 3).¹⁷

In the year 374 an **AB** or **ATB** monogram appears before the bust (Table 1, 19; Plate 14, 14). Above the **AB** is a horizontal line, and a small **v** sometimes appears above the **A**. There were eight coins with

¹⁶ This symbol was identified on a coin of 371 by Le Rider (above, n. 9), 434.

¹⁷ A clear example of a coin with a crescent behind the head may be seen in *BMCArabia*, pl. XLIV, 3. The tentative date of 375 S.E. assigned to the coin in *BMCArabia* seems unlikely as the reverse monogram and transitional, short beard on the obverse are more characteristic of 370 or 371 S.E.

complete or partial examples of this monogram in the hoard. Two similar monograms occur on other coins in the Characene series. On Attambelos I silver tetradrachms dated 266 through 268 a **BA** monogram sometimes appears in the right obverse field. The second monogram, in this case reading **AB** as on the present coins, was published by Le Rider and attributed to Attambelos V.¹⁸ Only a single example is known and its date, read as **ΤΠΔ**, 384, is partially obscured. A second **YA** monogram also appears on the obverse of the coin.

The number of examples with a clear **ΤΟΔ**, 374, date and **AB** monogram in the present group casts some doubt on Le Rider's attribution of a similar coin to 384 and a different king. It is possible that his Attambelos V coin is a variant of the Attambelos IV coins with the **AB** monogram. Unfortunately, additional evidence for attributing Le Rider's coin, such as reverse monogram and underarm letter, is absent.

Two other types of obverse devices appear on coins for which no clearly dated examples were found in the hoard. The first, with five examples, resembles a wreath or rayed circle with a large ribbon extending downward (Table 1, 17; Plate 14, 15). The ribbon is narrow at its junction with the circle and its bands widen as they extend downward. On three of these, partial dates of 37? place the coins in the Attambelos IV sequence. The upper portion of the right-hand digit on two of the coins resembles either a *gamma* or *epsilon*, suggesting either 373 or 375. All five examples have the variety 1 reverse, and one has a partial reverse monogram resembling that found on coins of 375, making it the most likely date for this variety of obverse device.

The second obverse symbol resembles a diadem tied in two loops with the loose ends flowing downward (Table 1, 18). Two examples were found in the hoard. On one of them, a partial date of 37? appears with a reverse monogram similar to that on coins of 372 with a variety 1 reverse. The underarm letter is also consistent with this tentative dating. A third undated coin with the same obverse symbol and reverse monogram was published by F. B. Shore¹⁹ and is reproduced here as Plate 14, 16.

¹⁸ Le Rider (above, n. 3), pp. 239–40.

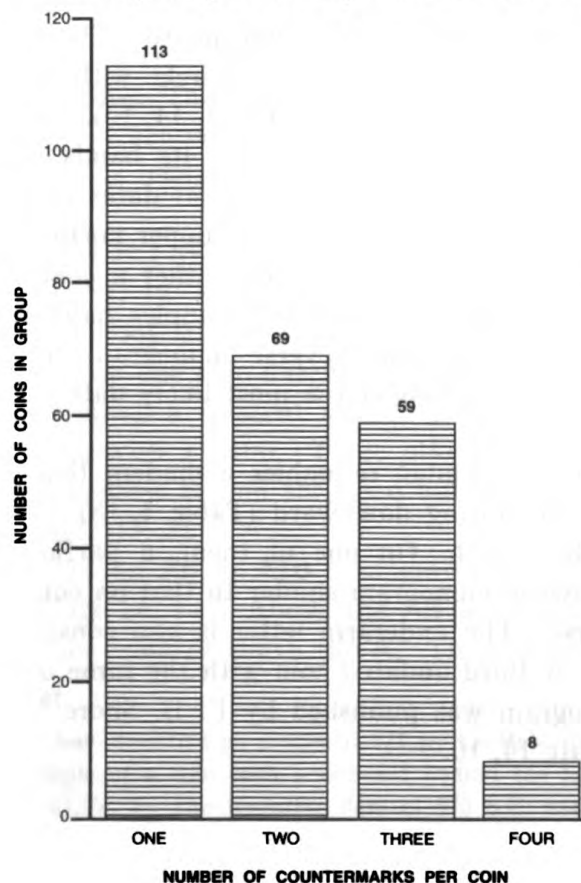
¹⁹ F. B. Shore, *Parthian Coins and History* (Quarryville, 1993), p. 52.

COUNTERMARKS

A total of 460 legible countermarks appear on 260 of the Attambelos IV coins in this hoard. While many coins contain one countermark, most contain two, three, or four (Table 7), always appearing on the obverse. The placement of the countermarks appears to have been deliberate to avoid defacing the portrait of the king. They are usually located on the neck, along the diadem band on the hair, and in the right obverse field before the bust. A few are located in the field behind the bust, usually on coins where there is insufficient room in the right field. There are six countermarks represented in the hoard (Table 8, 1-6; Plate 14, 17-22).

TABLE 7

Frequency of Multiple Countermarks



Three of the six countermarks are monograms, two of which are very similar to the reverse monogram mintmarks in front of Heracles' face (Table 8, 1 and 3). Countermark 1 is very similar to the monograms on the 370 and 371 S.E. coins, while 3 resembles the 375 reverse monogram (Plate 14, 17 and 19).

Countermark 2 is an **AB** or **ATB** monogram very similar to the one that occurs on coins dated 374 and on Le Rider's Attambelos V coin (Table 8, 2; Plate 14, 18). The countermark is normally found without the small **v** above the **A**, although one occurrence with the **v** was noted (Table 8, 7).

The **AB** monogram countermark is the only one of the six present on these coins which has received comment from previous authors. Babelon remarked that it may have been placed by the Attambelos reigning when Trajan arrived in 116. Hill, in *BMCArabia*, reiterated Babelon's remarks and agreed that the monogram probably stood for Attambelos.²⁰

No more than one example of countermarks 1, 2, or 3 occurs on any single coin, suggesting that the three monograms were contemporary and had similar functions. The most frequently occurring countermark is 1, which appears on 212 of the coins (Table 9). Countermarks 2 and 3 occur on a total of 36 coins. Thus, 248 of the 260 coins with legible countermarks in this hoard carried an example of one of the three monograms.













Countermark 4 is a helmeted bust facing right in an ovoid outline (Table 8, 4; Plate 14, 20). The portrait is very similar to classic depictions of Athena on Characene fractional bronze and lead coins of the first century A.D. Seventeen examples of this countermark were noted in the hoard.

Countermark 5 is an anchor with two horizontal bars at the top (Table 8, 5; Plate 14, 21) and it appears on 78 coins. The outline of the countermark closely follows the shape of the anchor. In one instance, however, the outline is oval and the anchor is very similar to the Seleucid countermark applied to coins in the second century B.C. (Table 8, 12). In the mid first century A.D., the anchor symbol is most closely associated with the coinage of Elymais, although the

²⁰ Babelon (above, n. 7), p. 397; *BMCArabia*, pp. ccii-cciii.

TABLE 8

Countermarks

1 	2 	3 	4 
5 	6 	7 	8 
9 	10 	11 	12 

countermarks have a somewhat finer style than the symbols which occur on Elymais coinage.

The sixth countermark which appears on 117 coins is a small circle resting on a horizontal line which appears to be supported by two lines descending at angles. The symbol occurs in an ovoid outline and may be a stylized depiction of a tied diadem (Table 8, 6; Plate 14, 22). The consistent placement of this countermark along the diadem band on the head supports this interpretation. It is very similar to the "fravahr" symbol found on Sasanian coins of the third and fourth centuries A.D. which has been described as a sign of enthronement.²¹

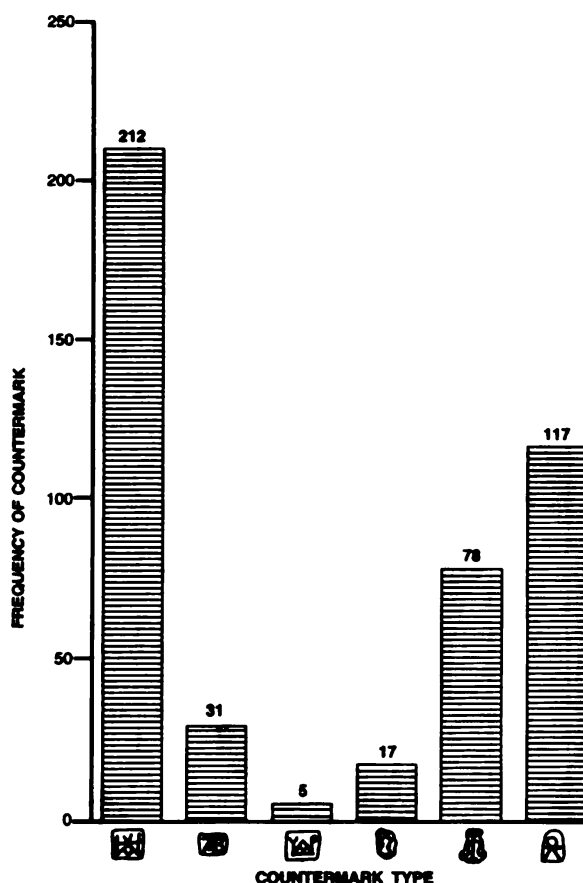
Single examples of additional countermarks which occur in the hoard are listed in Table 8 as numbers 8 through 11. These may be crude renderings of the official marks or simply poorly struck examples of countermark 1. On one coin, a possible anchor symbol (12) is engraved over another undecipherable mark.

Table 10 associates countermarks with datable coins. The absence of countermarks 3 and 4 on coins dated 375 is probably due to the small number of examples of these countermarks on datable coins.

²¹ R. Göbl, *Sasanian Numismatics* (Braunschweig, 1971), p. 21.

TABLE 9

Countermark Frequencies








The overall pattern of the table suggests that the countermarks were applied after all the coins had been issued.

The three monogram countermarks, 1, 2, and 3, were added sometime after 112. Evidence for this includes the presence of countermark 1 on a coin of Theonesos III in this hoard and the published examples of countermark 2 on coins of the same king.²² Countermark 3, appa-

²² *BMCArabia*, pl. XLIV, 8. Countermarks 1 and 2 also appear on Theonesos coins in Le Rider (above, n. 9), p. 435, 1-3.

TABLE 10

Countermarks by Date

						Number in Group	
365-368SE	+	+		+	+	17	
369-370SE	+	+		+	+	40	
370-371SE	+	+	+	+	+	86	
372-375SE	+	+		+	+	65	
374SE	+		+	+	+	25	
375SE	+	+			+	31	
Number in Group	116	18	2	11	47	70	264

+ = present on coins in group

rently previously unpublished, probably dates to the same time period as it occurs only in the absence of countermarks 1 and 2.

The next three countermarks, 4, 5 and 6, were probably placed on the coins between 64 and 103, as none of the three countermarks are known from issues of either Attambelos VI or Theonesos III, which date between 103 and 112. Unlike the three monogram countermarks, the helmeted bust, anchor, and diadem often occur on the same coin in various combinations, suggesting three separate countermarking episodes.

The orderly placement of most of the countermarks limits the usefulness of overstrikes for constructing a relative chronological arrangement of the earlier marks. Only eighteen examples of overstrikes were noted in the group. Both the helmeted bust and anchor are overstruck by two of the three monogram countermarks which reinforces the later placement of the monograms. In one instance, the diadem is overstruck on the anchor which suggests that it is later than the anchor.

The coins of Attambelos IV discussed above circulated in the Characene area for 50 to 90 years. On the conservative side, the 50 year estimate is the time between the last year of issue in 64 and the earliest possible date for the monogram countermarks in 112. The ninety-year lifespan accounts for the period between Attambelos's earliest dated issues and the coins of Meredates in 142/3, which were sometimes overstruck on Attambelos IV flans.²³ Events in the economic and political history of Characene are reflected in the design changes and countermarks present on the coins of this hoard. The history of the coins and, by extension, the Characene kingdom in this era may be separated into three periods: 1) 53 to 64, when the coins were minted; 2) 64 to 103, when few tetradrachms were struck but countermarking occurred on three occasions; and 3) 103–112 to 143, when no tetradrachms were issued and a fourth instance of countermarking took place.

1) 53 to 64

At least three Characene kings issued coinage for longer periods than Attambelos IV: Tiraos II, Attambelos I, and Attambelos II. None of these issues, however, exhibit the number of varieties found within the eleven year Attambelos IV series. Significantly, all of the varieties in the Attambelos IV series appeared within a six year period between

²³ *BMCArabia*, pp. ccxii and 313, 11; S. Nodelman, "A Preliminary History of Characene," *Berytus* 13 (1959–60), pp. 83–121. The evidence for overstriking of countermarked Attambelos IV tetradrachms is actually best for the king believed to have followed Meredates, Orabazes (also known as Obados or Obadias). Two published examples show the diadem countermark on the undertype of this king's coins: *BMCArabia*, pl. XLVII, 1, and M. Mitchener, *The Ancient and Classical World* (London, 1978), p. 127, 732.

58/9 and 63/4. Table 11 summarizes the coins of Attambelos IV in this hoard which include two obverse and reverse varieties, five obverse field devices, and a number of reverse monograms and under-arm symbols.

Attambelos IV appears to have produced one of the largest issues of tetradrachms in the Characene series. Including the present hoard, over 1,000 examples of his coins have been reported in the literature.²⁴ This number far exceeds the combined total of examples known for other Characene kings of the first century A.D. and is not approached again until the Aramaic issues of the late second century. While exact totals of examples are undoubtedly skewed due to the variables of preservation, recovery, and reporting, the fact that die links were found for less than ten percent of the coins in the present hoard also points to a substantial size of issue for Attambelos IV.

The prosperity of the Characene area was closely linked to its importance as a trade center for goods between India and the Roman Empire. A number of first and second century Nabatean and Palmyrene records cite the cities of Charax and Forat as important destinations along the caravan routes between the Persian Gulf and Seleucia-on-the-Tigris.²⁵ In the *Periplus Maris Erythraei*, which may have been written around the time of Attambelos IV, the Characene city of Apologos is listed as an *emporion*, suggesting a special and significant trade status for this location.²⁶ The importance of Characene in the trade network undoubtedly varied through the years, and the kings with well developed coin series probably reigned at times when Characene's role in the trade network was significant. Based on the available coin evidence, the reign of Attambelos IV appears to have been the high point in prosperity for Characene during the first century.

The increase in the status of Characene at this time may be due to developments in Roman and Parthian relationships. Specifically, beginning in 57, the invasion of Armenia by Corbulo and local uprisings in the eastern part of the empire may have served as distracting

²⁴ This total assumes that the current hoard and the Telloh hoard reflect two different assemblages of coins.

²⁵ Cited in Nodelman (above, n. 23), pp. 93–94, 102, 112–14; Potts 1988 (above, n. 4), p. 143.

²⁶ L. Casson, ed., *The Periplus Maris Erythraei* (Princeton, 1989), appendix 1.

TABLE 11

Attambelos IV Coin Varieties by Date

Seleucid Era Date	Beard	Obverse Monogram	Reverse Monogram	Underarm Symbol	Reverse Variety
365-368	None	None	Μ, Μ	Χ, Ι, Υ, Α, Π	1
369-370	None	None	ΒΛ, ΒΛ	Χ, Ι, Υ, Π, Ο, Χ	1
370-371	Short to Medium), ↓	Η, Η	Χ, Ι, Υ, Α, Π, Ο Β, Σ, Μ, Υ	1
372	Medium	None	Π, Π	Υ, Π, Ο, Β	1
372-373	Medium	None	ΒΔ, ΒΔ	Χ, Υ, Π, Ο, Β, Σ Δ, Η, Ι, Τ	2
374	Medium	ΣΒ	ΣΒ	Π, Ο, Β, Ι, Τ	1
375	Medium	Uncertain	ΨΡ	Π, Β, Τ	1
Undated #1	Medium	✱	Uncertain	Ι	1
Undated #2	Medium	✱	Uncertain	Uncertain	1

influences to the Parthians and the trade across Iran for goods from the east. As demand for goods such as silk was high during this period of Nero's reign, the disrupted northern trade routes may have been supplemented by increased traffic along alternative avenues, such as the caravan routes across Arabia. The conflicts between Parthia and Rome over succession were resolved in principle by 63 and in practice by 64.²⁷

The dates of these difficulties in Parthia coincide nicely with the increase in varieties and production seen in the coins of Attambelos IV. Bearded portraits first occur on the coins in 58/9 and are followed by five years of different obverse devices and a change in the seated Hercules reverse. If, as postulated above, the underarm letters represent workstations, the peak production of Attambelos IV coins occurred between 58 and 62 during the height of the conflicts. Their seemingly abrupt cessation also coincides well with the resolution of the conflicts and possible resumption of normal trade activities along the northern route.

A second source of numismatic evidence for the importance of Characene during this short period may be found in the remains excavated at Susa. Although Le Rider gives the number of coins recorded at Susa as 4,871, he excludes from this total "several thousand" small Characene lead fractions.²⁸ While most of these came from a single hoard, many were collected as isolated finds.²⁹ The lead fractions are crude, but sometimes carry the partial names of Theonesos or Attambelos. A beardless portrait, presumably early Attambelos IV, can be discerned on some of the examples. Le Rider believed the deposition of the hoard dated to sometime after 45, which suggests the fractions could have circulated, and perhaps some were minted, during the reign of Attambelos IV.

These lead fractions indicate that there were close economic ties between Characene and Susa in this period, perhaps in connection with the India trade route. This route is normally believed to have

²⁷ Shore (above, n. 19), p. 40; N. Debevoise, *A Political History of Parthia* (Chicago, 1938), pp. 179–202.

²⁸ Le Rider (above, n. 9), p. 5.

²⁹ Le Rider (above, n. 9), pp. 431–32.

been impractical due to the marshy conditions between the two areas.³⁰ The evidence of a large number of lead fractions, however, may reflect use of the less desirable Characene/Susa route on a temporary basis as a response to disruptions in the normal avenues of trade by the Roman/Parthian conflicts of this time.

Other evidence for the importance of the Characene area during the time of Attambelos IV is given by the scattered finds of his coins in outlying areas. In addition to Susa and the Telloh hoard, they have been noted in southeastern Arabia at the site of ed-Dur.³¹

2) 64 to 103

After Attambelos IV, countermarking of existing tetradrachms replaced minting in Characene for a period of approximately 39 years. The next king in the Characene line with well-documented coinage was Attambelos VI in 103/4. Between 64 and 103 only one Characene coin has been identified, the Attambelos V proposed by Le Rider and discussed above as of questionable attribution.

The lack of new coins in Characene probably served as an impetus for the use of the three different countermarks which appears on the coins in this period. Coinage for local commercial transactions would have been limited to the bronze tetradrachms and lead fractions on hand. Most of the available supply would have been from the large issue of Attambelos IV, and countermarking would have been a convenient way to facilitate the circulation of extant coinage.

The three countermarks (4, 5, and 6) which date between 64 and 103 are the helmeted bust, the anchor, and the tied diadem. Each countermark occurs in various combinations with the other two, suggesting three separate episodes of countermarks placement. A number of reasons can be given to suggest that each countermark was locally applied.

First, studies of Greek countermarks in the Hellenistic and Roman periods have indicated that most bronze coins were countermarked by

³⁰ D. Sellwood, "Trade Routes through Parthia," in *Coinage, Trade, and Economy*, ed. A. Jha (Bombay, 1991), pp. 23–27.

³¹ Potts 1988 (above, n. 4), pp. 141–42; Potts 1990 (above, n. 4), p. 291.

their place of origin for use in that city.³² Silver coins, on the other hand, were more likely to have been countermarked away from their minting city. The typically limited distribution of the bronze tetradrachms in this hoard is evidenced by the number of coins which bear two, three, or four countermarks.

Second, the placement of the countermarks, which deliberately avoided defacing the bust of the ruler, suggests the work was done by local authorities. The tied diadem is almost invariably found neatly placed along the diadem on Attambelos's head, the helmeted bust countermark is usually found on the neck, and the anchor is placed in the right or left field. The pattern of avoiding contact with Attambelos's face was followed consistently on coins with as many as four countermarks.

Third, at least two of the countermarks reflect themes which occur on the coinage of Characene: 1) the helmeted bust may be a representation of Athena who figures prominently on the reverse of the small lead fractions found at Susa, and 2) the diadem symbol occurs in at least two other forms on the obverse of the Attambelos IV coins. While none of the themes were unique to the area, the internal similarity between countermark and coin devices suggests at least some degree of affiliation between the coins and countermarks.

There is little agreement concerning the identity of the political authority in Characene between 64 and 103. Previous authors have attempted to fill the gap using a short passage in Lucian's *Macrobii* which states that Artabazos, the sixth successor of Tiraios on the throne of Characene, was reinstated by the Parthians and reigned at the age of 86 years.³³ On this basis, a non-coin producing king known as Artabaze to Babelon,³⁴ Orabazes I to S. Nodelman,³⁵ and as Artabazos or Attambelos to Hill³⁶ was inserted into the Characene coin list for the second half of the first century. None of the argu-

³² G. Le Rider, "Contremarques et surfrappes dans l'Antiquité grecque," in *Numismatiques antique, problèmes et méthodes*, (NancyLouvain, 1975), pp. 27-56; C. J. Howgego, *Greek Imperial Countermarks* (London, 1985).

³³ Lucian, *Macr.* 16.

³⁴ Babelon (above, n. 7), p. 393.

³⁵ Nodelman (above, n. 23), pp. 105-106.

³⁶ *BMCArabia*, pp. cci-ccii.

ments offered has been entirely convincing, and it appears impossible at this point to reconcile the Lucian passage with other available evidence.

The possibility that Characene was ruled by other than the local Hyspaosinid family in the second half of the first century has been suggested by Nodelman.³⁷ Relying on Chinese accounts, Nodelman relates that an emissary named Kan Ying visited the area and noted that Characene had formerly been governed by its own rulers but was at that time subjected to Parthia. Nodelman identified the Parthian ruler as Pacorus II. More recently, however, P. Bernard has argued that the accounts of Kan Ying do not refer to Characene but to Bushire to the east on the north side of the Perisan Gulf.³⁸

The idea that Parthian rulers actively governed in the Characene area during the last half of the first century cannot, however, be entirely discarded. On a statue of Heracles found at Seleucia, Pacorus II, the father of Meredates of Characene, is referred to as "(he) who was king before."³⁹ The wording is sufficiently ambiguous to make it difficult to determine whether Pacorus is being referred to as king of Characene and Parthia or king of Parthia alone.

Another way of considering possible Parthian interaction in Characene affairs takes into account the movements of rivals to the Parthian throne at this time. D. Sellwood has pointed out that, on the basis of tetradrachm minting at Seleucia, the political fortunes of Vologases II, Pacorus II, and Artabanus III in Mesopotamia may be best described as fluid.⁴⁰ Each controlled the mint at Seleucia for some period between 78 and 81 and held sway over other areas of the region for unknown periods at various times. One of these areas may have been Characene.

The most likely evidence for foreign influence or control of the area, however, is provided by the third countermark datable to this period, the anchor. While differing slightly in style, the anchor countermark

³⁷ Nodelman (above, n. 23), pp. 106–8.

³⁸ P. Bernard, "Vicissitudes au Gré de l'Histoire d'une statue en bronze d'Héraclès entre Séleucie du Tigre et la Mésène," *JSav.*, Janvier–Juin 1990, pp. 4–68.

³⁹ Potts 1988 (above, n. 4), pp. 149–50; Bernard (above, n. 38), pp. 23–27, 35, 38; W. Al-Salihi, "The Weary Hercules of Mesene," *Mesopotamia* 22 (1987), pp. 159–67.

⁴⁰ D. Sellwood, "New Parthian Coin Types," *NC* 1989, pp. 162–68.

is very similar to the symbol which appears on the coins of neighboring Elymais. Hoard evidence and the excavations at Susa suggest significant contacts between Elymais and Characene in the mid to latter half of the first century. Elymais's aggressive tendencies are exemplified by its takeover of Susa ca. 45.⁴¹ A foray by Elymais into Characene is not an unlikely scenario during, perhaps, the later portion of the century. Unfortunately, historical evidence for such a hypothesis is lacking.

3) 103–112 to 143

The next period of coin production in Characene took place between 103 and 112. Coins attributed to two rulers were issued within this period. Attambelos VI's dated coins correspond to the years 103 through 105 and coins for Theonesos III have been reported for two years corresponding to 110 through 112. After Theonesos III, Meredates issued coins dated the equivalent of 142/143.

The three monogram countermarks which appear on the coins of this hoard can be dated to the 30 year gap between Theonesos and Meredates. The earliest date for these countermarks would be 112 as they occur on coins of Theonesos III. Meredates' coins were not countermarked and were sometimes overstruck on the coins Attambelos IV. An exact beginning date for Meredates' reign cannot be determined, but must be placed before 131 when he is mentioned in a Palmyran inscription.⁴² The actual date may have been only shortly before this, as it is likely that Meredates was given control of the Characene area by his second cousin, Vologases III, whose reign began in 128.⁴³

Monogram countermarks occurred during a period for which no other coins of Characene have been documented. This second gap in the coinage lasted approximately 30 years between 113 and 142. In the interval between the countermarking eras, Attambelos VI (103–5) and Theonesos III (110–12) issued tetradrachms in quantities that were apparently too limited to displace the Attambelos IV coins.

⁴¹ Le Rider (above, n. 9), pp. 190, 426–30.

⁴² Cited in Potts 1988 (above, n. 4), p. 143.

⁴³ Potts 1988 (above, n. 4), p. 151

Over 95 percent of the coins in the present study group carry one of the monogram countermarks. The majority of coins with only a single countermark display one of the three monograms. By comparison, the most frequently occurring countermark from the latter part of the first century, the diadem, occurs on less than half of the coins. The frequency of the monogram countermarks suggests a significant restructuring of the local coinage in Characene between the years 113 and 142. That this countermarking took place on coins minted up to 90 years previously suggests Characene had not recovered its earlier prosperity. The regularity of the countermark placement and the absence of multiple monogram countermarks on the coins of this hoard may indicate a single episode of countermarking.

The ruler of Characene that may have been responsible for the monogram countermarks is the Attambelos known only from the writings of Dio Cassius.⁴⁴ This Attambelos was said to have been the ruler of Characene when Trajan arrived in 116. Although welcomed to Characene as a foe of the Parthians, Trajan demanded the payment of a tribute from Attambelos. Babelon used this passage to attribute the **AB** countermark to Dio Cassius's Attambelos based on the similarity of the monogram to the abbreviation of Attambelos. Evidence from the current hoard suggests the countermark was derived from a previous Attambelos IV tetradrachm variety. Nevertheless, the knowledge that the **AB** countermark was one of three equivalent which used devices already present on the coins supports the suggestion that they may have been chosen for their local significance by the contemporary ruler. A historically documented episode of tribute payment fits well with the high frequency of monogram countermarks found in this hoard. Also Dio Cassius's Attambelos is more likely than the following ruler, Meredates (131?–51), to have countermarked the coins. Meredates was probably an outsider who would have been unlikely to have utilized monograms with local reference to more prosperous times as countermarking symbols. His practice of overstriking older coins may, however, been a factor in the formation and deposition of the current hoard.

⁴⁴ Dio Cass. 68.28.4, cited in *BMCArabia*, pp. ccii–cciii.

Summary

The tetradrachms of Attambelos IV present a variety of devices and symbols within an 11 year striking period, 53–64 A.D. Analysis of these devices has enabled a chronological arrangement of the reverse monograms. Obverse devices, underarm symbols, obverse portrait, and reverse depictions have also been found to be useful for dating the coins within the minting sequence. The presence of six countermarks attests to the useful and long life of Attambelos IV tetradrachms.

Analysis of a single coin type which circulated for almost 90 years has also provided information on the history of Characene in the second half of the first and early portion of the second century A.D. The varieties in the coinage of Attambelos IV point to a robust economy during the years 58 to 63 which may reflect the area's increased role in eastern trade. Cessation of coinage in 64 was followed by a 39 year period in which three separate episodes of countermarking took place, possibly to restructure the declining coin supply for local needs. The almost total lack of tetradrachm production may have resulted from a loss of independence to the neighboring Parthian and/or Elymaean states. After a brief resumption of coinage over a ten year period, minting again stopped and countermarking reappeared during another long gap in the coinage. Historical documents relate that the area again lost its independence, perhaps as early as 128, to a member of the reigning Parthian dynasty.

APPENDIX

Coin Issuing Kings of Characene

	Estimated Regnal Dates in B.C./A.D. ^a	Known Examples Dated to Seleucid Era
Hyspaosines	125–121 B.C.	188, 190, 191
Apodacos	110–105	203, 207
Tiraios I	91–89	222, 223
Tiraios II	79–48	234–64
Artabazos	49/8	264
Attambelos I ^b	47–24	266–70, 272–79, 281, 283, 286–88

Theonesios I ^c	25–18	288–91, 293, 294?
Attambelos II	18 B.C.–A.D. 8	295–319
Abinergaos I ^d	9–22	321?; 322, 324?, 333
Attambelos III ^e	28–44	340?, 347, 349, 355
Theonesios II ^f	45–52	357, 363
Attambelos IV	53–64	365–75
Attambelos V ^g	72/3	384?
Attambelos VI	103–5	415, 416
Theonesos III	110–12	422, 423
Meredates	131?–51	454
Orabazes ^h	ca. 150	463?, 467?
Abinergaos II ⁱ	after 150	undated
Maga ^j	after 150	undated
Unknown Kings	after 150	undated

^a The information in this appendix is taken from Le Rider (above, n. 3) and Le Rider (above, n. 9), pp. 181–89, and revised where noted.

^b Nicolet-Pierre (above, n. 11), pp. 49–52

^c Nicolet-Pierre (above, n. 11), pp. 53–54

^d Also spelled Abinerglos and Adinergaos. An unpublished bronze fraction of this king with a Nike reverse appeared on the market in 1993. F. Gurnet, personal communication.

^e The date 340 S.E. (TM) may be read on a bronze fraction which appeared at Peus 333, 6–11 May 1992, 382. The date is read in the catalogue text as 390.

^f Also spelled Theonesos and Thionesios. Le Rider (above, n. 3) attributes the coins of 357 and 363 to two separate kings on the basis of orthography and portraiture. As no coins are known for the intervening years, it is reasonable to assume that the two coins with very similar names issued six years apart were struck by the same person until further evidence suggests otherwise.

^g A single known example published by Le Rider (above, n. 3, and above, n. 9). The date may possibly be read as 374 (Attambelos IV).

^h Also known as Obadas, Obadias, and Orabzes. Examples with readable dates appear in Mitchener (above, n. 23), 732, and Le Rider (above, n. 9), 444.

ⁱ Also known as Binaga, Binega, Banaga, and Abinerglos.

^j The latest date for coins with Aramaic legends issued by Maga and unknown kings is believed to precede the Sasanian conquest of the area in A.D. 228.

KEY TO PLATES

1. BI tetradrachm, Attambelos III, 347 S.E.
2. Beardless obv. portrait variety, Attambelos IV.
3. Bearded obv. portrait variety, Attambelos IV.
4. Variety 1 rev., club in r. hand, Attambelos IV.

5. Variety 2 rev., club in l. hand, Attambelos IV.
6. Rev. monogram, 365–68, enlarged.
7. Reverse monogram, 369–70, enlarged.
8. Reverse monogram, 370–71, enlarged.
9. Reverse monogram, 372, variety 1 rev., enlarged.
10. Reverse monogram, 372/3, variety 2 rev., enlarged.
11. Reverse monogram, 374, enlarged.
12. Reverse monogram, 375, enlarged.
13. Palm in r. field, partially obscured, 370/1.
14. **AB** in r. field, 374.
15. Wreath with ribbon in r. field, date unknown.
16. Diadem in r. field, date unknown, from Shore 1993.
17. Monogram countermark 1, enlarged.
18. Monogram countermark 2, enlarged.
19. Monogram countermark 3, enlarged.
20. Helmeted bust countermark 4, enlarged.
21. Anchor countermark 5, enlarged.
22. Diadem countermark 5, enlarged.

VESPASIAN'S SYRIAN PROVINCIAL COINAGE

(PLATES 15-20)

RICHARD G. McALEE

The Syrian provincial coinage struck under the Roman emperor Vespasian is noteworthy in several respects.¹ Silver tetradrachms were struck at several different mints, with a diversity and complexity unmatched until the coinage of Caracalla. Roman imperial aurei and denarii were also struck in Syria for the first time. Bronze coins with Latin legends and the traditional reverse type with the letters SC surrounded by a wreath (which were usually struck exclusively at Antioch) were struck at two different Syrian mints, and the local aes was supplemented for the first time by an orichalcum coinage struck in Rome for use in Syria. This article categorizes the tetradrachms in ten groups and attributes the provincial coinage to five Syrian mints and the mint of Rome, as summarized in Table 1.

¹ The author would like to express his gratitude to the following persons for their help in producing this article: Dennis Kroh, who assisted in the preparation of the first draft; Michel Prieur, who provided copies from his photofile of tetradrachms; Michel Amandry, who provided information about his own research on Syrian provincial coins for the forthcoming second volume of *Roman Provincial Coinage*; Barry Murphy of Classical Numismatic Group, who photographed the coins in the author's collection; William E. Metcalf, who provided valuable comments on the various drafts; the curators of the Berlin, London, Munich, New York, and Paris museums, who supplied casts of coins in their collections; and Leu Numismatik, Numismatica Ars Classica (NAC), Dr. Busso Peus Nachf., and Stack's, which provided photographs from their catalogues.

TABLE 1

	<i>Ϝ</i> Tetradrachmss	<i>Ϝ</i> Denarii and <i>Α</i> Aurei	Bronze Aes	Orichalcum Aes
Mint	Group, Rev. Type	References	Rev. Type	Denom., Rev. Type
Antioch	1. Eagle, no wreath, on thunderbolt		SC in wreath, no consular date	—
	2. Head of Titus	<i>RIC</i> 2, 351–52; <i>BMCRE</i> 2, pl. 18, 5–6; pl. 19, no. 14	Name in wreath	
	3. Eagle, no wreath, on club	Leu 54, 4/28/92, 234; NAC 5, 2/25/92, 440		
Tripolis (?)	4. Eagle, wreath, on wreath, AV-TOKPA... 6. Eagle wreath, on club, AVTOKPA...	—	—	—
Aradus (?)	5. Eagle, wreath, on wreath and crescent 7. Eagle, wreath, on club and crescent	—	—	—
	Judaea Capta	8. Eagle on palm branch or caduceus, club in field	<i>RIC</i> 2, 369–73; <i>BMCRE</i> 2, pl. 19, 9–12; NAC/Spink 11/16/94, 305	—
Tyre	9. Eagle, wreath, on club, AVTOKPATΩP...		SC in wreath, consular date	—
	10. Eagle on altar, AVTOKPATΩP...	<i>RIC</i> 2, 456–58; <i>BMCRE</i> 2, pl. 18, 15, 18; <i>RIC</i> 2, 360–68; <i>BMCRE</i> 2, 505–22	ΕΤΟΥΣ Α in wreath; 3-horned altar	
Rome	—	—	—	Quadrans-Caduceus Semis-Tyche As-SC in wreath Dupondius-caduceus, crossed cornucopia

The Tetradrachms

It has long been suspected that Vespasian struck tetradrachms at more than one Syrian mint, but there has been considerable uncertainty as to the number of mints and their location. For example, some of the tetradrachms attributed to Antioch in *BMCGalatia* are also listed in *BMCPhoenicia*.

The late C. M. Kraay made the only notable attempt to date to categorize the mints.² He attributed Vespasian's tetradrachm coinage and that of Nero, Galba, and Otho to four mints, classified by the reverse type, as follows:

Mint A, eagle on thunderbolt or head of Titus (Plate 15, A and 1–10).

Mint B, eagle with wreath in beak, standing on wreath or club (Plates 16 and 17, B–D, 18–27, and 35–38).

Mint C, eagle, no wreath in beak, standing on club (Plates 15 and 16, 11–17).

Mint D, eagle, no wreath in beak, standing on palm branch, club in l. field (Plate 17, 29–34).³

The attribution of the tetradrachms of Nero, Galba, and Otho (and by implication, those of Vespasian) to more than one mint has been questioned by the authors of *RPC*, who concluded that it "seems most likely that all of the coins form a single sequence from Antioch, though it must be admitted that, on stylistic grounds, this is rather surprising."⁴ More recently, Kevin Butcher has expressed agreement with this view.⁵

² Colin M. Kraay, "Notes on the Early Imperial Tetradrachms of Syria," *RN* 1965, pp. 58–68. Other sources cited here include: I. Carradice and M. Cowell, "Minting of Roman Imperial Bronze Coins for Circulation in the East: Vespasian to Trajan," *NC* 1987, pp. 26–50; W. E. Metcalf, "The Flavians in the East," in *Proceedings of the 9th International Congress of Numismatics*, ed. T. Hackens and R. Weiller (Luxembourg, 1982), pp. 321–39; D. R. Walker, *The Metrology of the Roman Silver Coinage*, Part 1 (Oxford, 1977); W. Wruck, *Die syrische Provinzial Prägung von Augustus bis Traian* (Stuttgart, 1931) (hereafter, Wruck); and A. Burnett, M. Amandry, and P. P. Ripolles, *Roman Provincial Coinage* (London and Paris, 1992), vol. 1 (hereafter, *RPC*).

³ Kraay (above, n. 2), pp. 67–68.

⁴ *RPC*, p. 608.

⁵ K. E. T. Butcher, review of *RPC*, in *NC* 1993, pp. 292–99, esp. pp. 292 and 298.

There is one strong argument advanced by these authors for reattributing to Antioch the coins which Kraay assigned to other mints, which is that some of them are dated by the Caesarean era, which was used by Antioch as its civic era. But this argument applies only to the coins of Nero and a few of Galba. The Caesarean era was not used on any of the tetradrachms of Otho or Vespasian, or on the tetradrachms of Galba from Kraay's mint B, and under these emperors there are clear divergences in style, fabric, symbols, and letter forms which indicate that different mints were at work. Even if the authors of *RPC* are correct in attributing all of the tetradrachms of Nero with eagle reverse to Antioch, the arguments advanced by Kraay for attributing some of the Syrian tetradrachms of subsequent emperors to mints other than Antioch continue to have merit.

Kraay's analysis is helpful, but it is deficient in two important respects. First, it does not differentiate between several mints which he grouped together as mint B (although Kraay recognized that he may have grouped coins from more than one mint under mint B).⁶ Secondly, it does not recognize that mint A and mint C are, in fact, one and the same, Antioch.

The principal reason for the confusion about the places where the tetradrachms were struck is that they did not consistently follow the Syrian convention of identifying the mint by the object below the eagle. Under Vespasian the same mint sometimes used different symbols at different times, and different mints sometimes used the same symbol.

There was, apparently, a decision early in Vespasian's reign to standardize the symbols on the tetradrachms by replacing the local emblems, such as the thunderbolt of Antioch and the wreath of mint B, with a symbol of wider significance—the club. This symbol, long associated with the silver coins of Tyre, was probably intended to indicate that the Vespasianic coins were struck on the Tyrian standard and were tariffed at four denarii.⁷ The policy did not survive the

⁶ Kraay (above, n. 2), p. 68.

⁷ See Walker (above, n. 2), pp. 70–71, discussion of Tyrian standard, and p. 137, Flavian tetradrachms of Syria contain "almost exactly the same weight of silver as four denarii of the mint of Rome."

reign of Vespasian. When the Antioch mint resumed striking under Domitian, it employed the thunderbolt symbol. When the club reappeared under Trajan, it was used as a mint mark by Tyre.

Ten groups of Flavian tetradrachms⁸ can be distinguished on the basis of significant distinguishing features of the types or legends. The ten groups and Kraay's corresponding classification are summarized in Table 2.

TABLE 2

Group, Kraay, Plate	Rev. Type	First Word of Obv. Legend	Years Struck
1, A, Pl. 15, 1-3	Eagle, no wreath in beak, standing on thunderbolt	AYTOKPAT	1, 2
2, A, Pl. 15, 5-10	Head of Titus	AYTOKPAT	2
3, C, Pl. 15-16, 11-17	Eagle, no wreath in beak, standing on club	AYTOKPAT	2, 3, 4, 5
4, B, Pl. 16, 18	Eagle, wreath in beak, standing on wreath	AYTOKPA	1
5, B, Pl. 16, 19	Eagle, wreath in beak, standing on wreath, crescent between legs	AYTOKPA	1
6, B, Pl. 16-17, 20-24	Eagle, wreath in beak, standing on club	AYTOKPA	1, 2, 3
7, B, Pl. 17, 25-27	Eagle, wreath in beak, standing on club, crescent between legs	AYTOKPA	2
8, D, Pl. 17, 29-34	Eagle on palm branch or caduceus, club in field	AYTOKP	3
9, B, Pl. 17-18, 35-38	Eagle, wreath in beak, standing on club	AYTOKPATΩP	1, 2, 3
10, - Pl. 18, 39	Eagle standing on altar	AYTOKPATΩP	4, 5

This classification does not imply that each group was struck at a different mint, or even that all the coins within a group were struck at the same mint—although, with a few minor exceptions, the latter appears to be the case. It is intended as a convenience in reference and attribution and as an aid to understanding the complex structure of the coinage.

In the analysis of this coinage, it is useful to begin where the evidence is the clearest. The Flavian coins of group 4 are similar in

⁸ The tetradrachms with the reverse type of Zeus standing included in Wruck's catalogue (Wruck 91) are not listed here because they were struck in Cyprus on a different weight standard. Vespasian also struck Cypriot tetradrachms with the reverse type of the temple of Paphian Aphrodite (see *SNGCopCyprus* 77 and 78).

style, fabric, and mint symbol (eagle on wreath) to the tetradrachms of Galba and Otho attributed by Kraay to mint B (see Plate 16, B and C) and must belong to the same mint. Vespasian's coins of group 4 are very rare and were struck only during the first year of his reign. But the coins of group 6 are common (at least for year two) and are quite similar to those of group 4, sharing the same obverse legend, fabric, and style of eagle, except that the eagle perches on a club instead of a wreath. The connection between groups 4 and 6 is confirmed by a die link between two coins, both of Vespasian's year one (see Plate 16, 18 and 20). It is therefore apparent that the coins of groups 4 and 6 are the products of a single mint which functioned continuously under Galba and Otho and from the first through the third year of Vespasian's reign, and that shortly after his accession the mint changed the symbol beneath the eagle from a wreath to a club. It is firmly established, therefore, that at least one of Vespasian's mints changed its symbol during his reign.

Kraay tentatively identified mint B as Tripolis. The reasons he cited for this attribution were: (1) tetradrachms were struck for Galba at Kraay's mint A and mint B, but for Otho only at the latter, and Tripolis was one of the few cities in Syria to reflect Otho's brief reign on its coins (using countermarks); and (2) the form of omega on the tetradrachms of Galba and Otho of mint B is ω which is unusual and also occurs on the contemporaneous coins of Tripolis.⁹

The coins of groups 5 and 7 are generally similar to those of groups 4 and 6 respectively, but differ stylistically and bear a crescent between the eagle's legs as a secondary symbol. As in the case of Tripolis (?), this mint also struck coins under Otho (see Plate 16, D), but unlike Tripolis(?), there are no coins of Galba. Although there is no die linkage yet known, the presence of the crescent and certain distinctive stylistic features (an eagle with rounded wings, the letter P with a very small head, and a palm branch with fronds on both sides) show that the coins with a crescent struck under Otho and Vespasian were all produced by a single mint and that it too changed its primary symbol from a wreath to a club shortly after Vespasian's accession. This mint is tentatively identified by the author as Aradus, because a

⁹ Kraay (above, n. 2), pp. 67-68.

crescent was used as a mint symbol for that city on tetradrachms struck under Caracalla and Macrinus.¹⁰ Aradus and Tripolis are in the same geographical area (northern Phoenicia), which is consistent with the general similarity of the coins of groups 5 and 7 to those of groups 4 and 6.

The coins of groups 1, 2, and 3 share a common obverse legend, fabric, style, and epigraphy, all of which clearly distinguish them from the other mints already mentioned.

- a) The obverse legend is almost always **ΑΥΤΟΚΡΑΤ ΚΑΙΣΑ ΟΥΕΣΠΑ-ΣΙΑΝΟΒ**.¹¹
- b) The coins are struck on small, thick flans, much less "spread" than those of Tripolis(?).
- c) The style is usually, though not always, fairly crude, and much less attractive than the frequently elegant coins of Tripolis(?).
- d) The lettering is uniform throughout, consisting of short, bold strokes, and is readily distinguishable from the epigraphy of the other mints.
- e) The letter sigma always has the form **Σ**, while on the coins of groups 4-7 and 9-10 it usually has the form **C**.

The coins of groups 1, 2, and 3 should be attributed to Antioch. The eagle without wreath in beak standing on a thunderbolt, the letter forms, and the use of a bust with an aegis (seen in group 1 only) are characteristics shared with the Neronian tetradrachms struck at Antioch during 59/60-63/4 (see Plate 15, A, a tetradrachm of Nero of 63/4).¹² As in the case of Tripolis(?) and Aradus(?), Antioch's distinctive mint mark (in this case a thunderbolt) was changed to a club early in Vespasian's reign. During Vespasian's second regnal year coins were also struck with the reverse type of a head of Titus. Although no die link between groups 1, 2, and 3 has yet been

¹⁰ A. R. Bellinger, *The Syrian Tetradrachms of Caracalla and Macrinus*, ANSNS 3 (New York, 1940), 230-37, 242-46, and 249-51.

¹¹ The only exceptions are 10, which should be attributed to Aradus (?), and 17, which is a unique hybrid with an Alexandrian obverse.

¹² *RPC* 4180-90. The thunderbolt also appears on some of Galba's tetradrachms, but the other characteristics mentioned are absent from Galba's coins (*RPC* 4193-196B).

observed, confirmation of the connection between groups 2 and 3 is provided by a distinctive symbol. On coins of group 2 either a star or a lituus appears behind the head of Titus,¹³ and the lituus also appears on some coins of group 3 in the right field of the obverse. The lituus symbol was also used in the same position on bronze coins of Claudius and Nero struck at Antioch,¹⁴ which supports the attribution of these tetradrachms. Moreover, while there is a good deal of variety in the portrait styles in the tetradrachms of group 3, some portraits are so similar to those in group 2 that they must be from the same hand.¹⁵ It is also noteworthy that the mean weight and silver content of the coins of groups 1 and 2 are virtually identical to those of the coins of group 3, and slightly different from those of the coins of other groups.¹⁶

The coins of group 8, with obverse portrait of Vespasian or Titus, stand alone. The mint is Kraay's mint D, which he identified as Tyre, but there is reason to believe that these coins may not have been struck at Tyre, but rather at a mint in Judaea Capta (see discussion below).

The tetradrachms with obverse portrait of Titus are to be grouped with those of Vespasian in group 8, since they have the characteristic club in the field to the left of the eagle. They are dated year three, which Wruck interpreted as signifying Titus's third year as Emperor (72/3).¹⁷ The better view, however, is that the date refers to Vespa-

¹³ The coins in group 2 with star are die linked to those with lituus, confirming that they are from the same mint. See 9 in the catalogue and accompanying footnote. These symbols might be officina marks, or they might be chronological. The star symbol on coins of Alexandria was taken by Dattari to indicate the change of the Roman year. (The author is indebted to William E. Metcalf for the latter suggestion.)

¹⁴ *RPC* 4282 (Claudius) and 4307-8 (Nero). The lituus symbol, however, is not confined to Antioch. See, for example, *RPC* 4618 (Sidon, Nero).

¹⁵ Compare Wruck, pl. 4, 80 (group 2) and the Numismatic Auction Ltd. 2, 12 Dec. 1983, lot 283 (group 3).

¹⁶ See Walker (above, n. 2), table at p. 137. Mean weight of coins from Kraay's mint A is 14.30 g; from mint C, 14.31 g. Mean silver content for mint A is 78.92%, for mint C, 78.73%.

¹⁷ Wruck, pp. 126-27.

sian's third regnal year (70/1).¹⁸ Vespasian's group 8 tetradrachms are also dated year three, which would indicate that Titus's tetradrachms were struck at the same time.

On most of the group 8 tetradrachms the eagle stands on a branch, but there is a rare variety with obverse head of Titus in which the eagle stands on a caduceus (Plate 17, 34). This variety also has an object or objects in the upper right field of the reverse behind the eagle's head, sometimes identified as a quiver and bow. It is not clear whether the symbols indicate a different mint, a second officina, a change in the mint's symbol, or merely a stylistic variation. The caduceus might symbolize the coming of peace to the region after the capture of Jerusalem in 70, although the stronghold of Masada did not fall until 73. The caduceus also appears on the group 10 tetradrachms of Vespasian, struck in regnal years four and five, 71/72 and 72/3.

Kraay attributed the coins of group 8 to Tyre because of the club which appears in the reverse field. The club symbol was used repeatedly as a Tyrian mint mark on the city's autonomous tetradrachms, on coins of Trajan, and again under Caracalla. However, the later autonomous tetradrachms and didrachms of Tyre have been reattributed by Meshorer to Jerusalem.¹⁹ The Flavian tetradrachms of group 8 were probably struck in Judaea Capta after its conquest by the legions commanded by Titus, using the same symbol which had most recently been employed for silver coinage struck (or at least generally accepted) in the province. This theory fits a number of facts.

- a) The tetradrachms were struck in regnal year 3 (70/1), which coincides with the fall of Jerusalem in August 70.

¹⁸ Kraay (above, n. 2), p. 67, n. 2.

¹⁹ Y. Meshorer, *Ancient Jewish Coinage*, vol. 2: *Herod the Great through Bar Cochba* (Dix Hills, NY, 1982), pp. 7–9. These coins were struck as late as 65/6, according to Y. Meshorer, "One Hundred Ninety Years of Tyrian Shekels," in *Studies in Honor of Leo Mildenberg*, ed. A. Houghton, et al. (Wetteren, 1984), pp. 177–78, and pl. 26. The authors of *RPC* disagree with the reattribution and prefer to assign all of the autonomous tetradrachms to Tyre. (*RPC*, pp. 655–56.) The attribution to Jerusalem has also been questioned by Brooks Levy, "Tyrian Shekels and the First Jewish War" *Proceedings of the 11th International Numismatic Congress*, ed. T. Hackens and Gh. Moucharte (Louvain-la-Neuve, 1993), pp. 267–74.

- b) They feature Titus more prominently than do the tetradrachms from other mints, which is consistent with his role as supreme commander in Judaea and with the greater prominence given Titus on the bronze coinage of Judaea Capta.²⁰
- c) The coins have characteristics that are consistent with a military issue: they are limited to a single year, they are of rougher workmanship than the other issues, and their silver purity is highly variable.²¹
- d) The tetradrachms display some similarity in style to the bronze coinage of Judaea Capta.²² (See Plate 17, 32 and E.)
- e) The group is linked to certain aurei which feature victory in the Jewish War as a central theme (see section on aurei and denarii below).

The coins of group 9 are superficially similar to those of group 6, in that the eagle has a wreath in its beak and stands on a club, but they are distinctly different in the following ways.

- a) Obverse legend: it begins at the upper right instead of below the bust, and begins **AVTOKPATΩP** instead of **AVTOKPA**.
- b) Fabric: they are noticeably smaller in diameter.
- c) Style: the portrait is more rounded, in higher relief, and the eagle has a characteristic pose, diagonal rather than upright.
- d) Epigraphy: the letters are smaller and neater, the kappas fully formed rather than with small frontal strokes.

Group 9 must, therefore, be the product of an entirely different mint.

Finally, there are the tetradrachms of group 10, which have the reverse type of an eagle on an altar, with a caduceus in its beak and a branch in its claw, which represents an unusual departure from the

²⁰ D. R. Sear, *Greek Imperial Coins and Their Values, the Local Coinages of the Roman Empire* (London, 1982), p. 75.

²¹ Walker (above, n. 2), p. 136 (90.25%, 59.00%, and 49.50%, the latter two being the lowest figures of all the Flavian tetradrachms analyzed).

²² E.g., H. C. Lindgren and F. L. Kovacs, *Ancient Bronze Coins of Asia Minor and the Levant* (San Francisco, 1985), 2511 and 2513; *SNGCopPalestine* 106. The exact place of minting of these coins is uncertain.

standard motif. There are several points of similarity between the coins of this issue and those of group 9, including word forms (there are no abbreviations in the obverse legends), style, and epigraphy, but those similarities are not so strong as to be conclusive by themselves. In addition, however, some coins of group 9 share an unusual characteristic with those of group 10, a circular line just below the legends, apparently incised in the dies as a guideline for the letters. When we also consider the fact that the coins of group 10 commence when those of group 9 cease (there are coins of years one, two, and three for group 9, and of years four and five for group 10), it seems likely that they are from the same mint as the coins of group 9. This mint will be referred to hereafter as the "Altar Mint." If the group 8 tetradrachms were struck at a mint in Judaea Capta, as seems likely, then the best candidate for the Altar Mint is Tyre.²³ This is consistent with the fact that the coins of group 9 are the only ones on which a club was used as the initial symbol during Vespasian's first regnal year. At that point the symbol would have been used as a mint mark by Tyre, prior to its adoption as a mark of value for all Syrian tetradrachms struck on the Tyrian standard.

There are a few cases in which coins in a particular group are interlopers from a different mint. The first is 10, a rare variant of the type with the head of Titus reverse. The style and obverse legend are characteristic of group 7, Aradus(?) rather than Antioch, and the reverse lacks the typical symbol of star or lituus. The coin is die linked with one of group 7, leaving no doubt that it is a product of Aradus(?) rather than Antioch (Plate 15, 10, and Plate 17, 26). The second instance is 24 in group 6, which also exhibits the fabric, style and obverse legend of Aradus(?), although it lacks the characteristic crescent mint signature. It is possible that the crescent was dropped towards the end of this mint's production as part of the trend toward uniformity in symbolism on Vespasian's Syrian tetradrachms, or that it was omitted in error from a few dies.

There is one other interloper that raises some very interesting questions: a unique tetradrachm in the author's collection, 17, with the

²³ H. Seyrig, "Antiquités Syriennes," *Syria* 39 (1962), p. 203 and n. 3, suggested Tyre, or alternatively Heliopolis, as the mint for the group 10 coins.

obverse of an Alexandrian tetradrachm, coupled with an Antiochene reverse. The obverse is undoubtedly Alexandrian, for it has not only the characteristic Alexandrian date in the field, but also the Alexandrian obverse legend which is otherwise never seen on Syrian coins. The reverse (eagle without wreath in beak atop club) is just as certainly Syrian. The weight and the appearance of the metal suggest that the coin was struck at Antioch, not Alexandria. How could an Alexandrian obverse die find its way to Antioch? The answer is speculative, but one possible explanation is that one or more die engravers were transferred from Alexandria to Syria (something for which there is also evidence under Trajan). The engraver may have brought an obverse die with him to use as a model, and the die might then have been confused with a local product and used by accident. It is noteworthy that many of the tetradrachms of groups 1, 2, and 3 are similar to those of Alexandria in style and epigraphy.²⁴ There may have been an exchange of personnel between the mints, resulting in a cross-fertilization similar to what was seen in the coinage of Rome at about the same time when the mint of Tarraco was closed.²⁵

As summarized in Table 3, the ten groups of tetradrachms can be allocated to five mints, with the exceptions previously noted. This table illustrates the continuous production of the mints despite the changes in the symbols which appeared on the coins, and the standardization of those symbols to a club which occurred by Vespasian's second regnal year.

TABLE 3

Mint	Group	Rev. Symbol	Years Struck
Antioch	1	Eagle on thunderbolt	1 2 - - -
	2	Head of Titus	- 2 - - -
	3	Eagle on club	- 2 3 4 5
Tripolis(?)	4	Eagle on wreath	1 - - - -
	6	Eagle on club	1 2 3 - -
Aradus(?)	5	Eagle on wreath	1 - - - -
	7	Eagle on club	- 2 - - -
Judaea Capta	8	Club in field	- - 3 - -
Tyre	9	Eagle on club	1 2 3 - -
	10	Eagle on altar	- - - 4 5

²⁴ For example, compare Sear (above, n. 20), 747 and 748.

²⁵ *Roman Imperial Coinage 2, Vespasian to Hadrian* (1986), p. 2. (hereafter, *RIC*).

The Aurei and Denarii

Although a full discussion of the aurei and denarii is beyond the scope of this article, they deserve mention here.²⁶ Under Vespasian, imperial aurei and denarii were struck in Syria for the first time.²⁷

Tacitus records that soon after Vespasian was acclaimed as emperor on 1 July 69 in Alexandria, gold and silver coins were struck for the new regime at Antioch.²⁸ A varied group of aurei and denarii are attributed to Antioch in the standard references.²⁹ Several of the aurei can be matched to corresponding tetradrachms because of strong stylistic similarities. Aurei with a reverse type of a head of Titus closely resemble the group 2 tetradrachms of the same type.³⁰ While undated, these aurei were almost certainly struck at the beginning of Vespasian's reign, and it is probably these coins to which Tacitus refers. Needless to say, this greatly strengthens the attribution of the group 2 tetradrachms to Antioch. Moreover, Metcalf has pointed out that certain rare aurei datable to 70 have a portrait of Vespasian which matches those on the tetradrachms of group 3 dated year two (69/70) and year three (70/1).³¹ Compare Plate 16, 19, and Plate 18, F.³² This likewise strengthens the attribution of the group 3 tetradrachms to Antioch. There is also a strong similarity between

²⁶ For a detailed discussion of these coins, see Metcalf (above, n. 2), pp. 321–39.

²⁷ Some imperial denarii may have been struck in Syria, including some of Antony's coins and the denarii of Cleopatra and Antony, *RPC*, p. 587. Another issue which may have been struck in Syria is the rare coinage of Labienus, M. H. Crawford, *Roman Republican Coinage* (Cambridge, 1974), 524/1 and 524/2.

²⁸ Tac., *Hist.*, ii, 82.

²⁹ *RIC*, pp. 56–58; *Coins of the Roman Empire in the British Museum*, vol. 2, *Vespasian to Domitian*, 2nd ed. (1976), pp. 104–9 (hereafter, *BMCRE*). *BMCRE* 525, attributed there to Alexandria, is of Syrian origin (Metcalf [above, n. 2], p. 324).

³⁰ *RIC*, pl. II, 24; *BMCRE*, pl. 18, 5–6, and pl. 19, 14; Metcalf (above, n. 2), pl. 37, 4–5.

³¹ Metcalf (above, n. 2), p. 324 (pl. 37, 6–7).

³² The tetradrachm is from Coin Galleries, 15 Nov. 1989, 456. The aureus is from NAC 5, 25 Feb. 1992, 440. The similarity of the portraits disproves the attribution to Alexandria which is suggested by the cataloguer of the NAC aureus mentioned in the following footnote. See also Leu 54, 28 Apr. 1992, 234.

certain rare aurei and the tetradrachms of group 8, which Mattingly pointed to in support of the attribution of the aurei to Tyre, but which would also be consistent with a mint in Judaea Capta producing both gold and silver (Plate 18, G).³³ Most striking of all is the similarity between a group of aurei with Vespasian's head left and the tetradrachms of group 10 (Plate 18, H).³⁴ The match is so close that there can be no doubt that they were struck at the Altar Mint, and they are dated COS IIII, i.e., 72/3, which indicates that they were issued contemporaneously with the group 10 tetradrachms. These aurei are generally attributed to Antioch,³⁵ but the attribution of the tetradrachms discussed above indicates a different mint, i.e., Tyre.

The denarii (Plate 18, I) are not sufficiently similar to any of the tetradrachms to permit matching of the same sort, but Metcalf has pointed out that the denarii with reverse types Concordia seated, Neptune standing, Victory advancing right, Jewess right, and emperor in quadriga (which in the case of Vespasian's issues, as opposed to those of Titus, are all dated COS IIII) share a feature with the COS IIII aurei and the group 10 tetradrachms which has already been mentioned: a circular line lightly incised in the dies to properly align the legends.³⁶ This suggests that this group of denarii was also struck at the Altar Mint. As previously noted, the same circular line appears on some tetradrachms of group 9, thus reinforcing their attribution to the Altar Mint, i.e., Tyre.

³³ *BMCRE*, pp. lxviii, 109–10 (pl. 19, 9–12). The association with Judaea Capta is strengthened by a previously unconfirmed aureus of this group with rev. Roma (Virtus) and Jewish captive, *Numismatica Ars Classica*, 16 Nov. 1994 (Steinberg), 305, here Plate 18, G.

³⁴ *RIC*, pl. II, 27; *BMCRE*, pl. 18, 15 and 18; Metcalf (above, n. 2), pl. 37, 9–12 and 15.

³⁵ But see *RIC*, p. 4, and *BMCRE*, p. lxviii, suggesting Alexandria as a possibility. The cataloguer of *Numismatica Ars Classica* 16 Nov. 1994 (Steinberg), 305, makes a detailed but unconvincing argument that all of Vespasian's Syro-Phoenician aurei were struck at Antioch.

³⁶ Metcalf (above, n. 2), p. 325.

The Local Aes Coinage

Provincial coins of leaded bronze³⁷ were struck at Antioch with the reverse type **SC** in wreath, and denominations as and semis,³⁸ which had been employed since the time of Augustus (Plates 18–19, 42–54).³⁹ Antioch also produced the last of the “name and wreath” bronzes during Vespasian's reign, a traditional Antiochene type honoring the Syrian *legatus*. These very rare coins are known with obverse types of Vespasian and Titus. See p. 143, 48.

In addition, the aes coinage is complicated by the appearance of **SC** bronzes from a second mint in Syria-Phoenicia, and also of orichalcum coins with **SC** in wreath struck in Rome for use in Syria. All of these issues have usually been lumped together as Antiochene.

The **SC** issues from the second local mint (Plate 19, 55) are distinguishable from those of Antioch by the following features:

- a) the diameter of the asses is noticeably smaller (ca. 25 mm) than those from Antioch (ca. 27–30 mm), although the weight is similar;
- b) they are struck only in the larger denomination (as);
- c) the obverse legend is different and includes a consular date (**COS IIII** or **COS V**), which is not otherwise seen on the local **SC** bronzes of this period;⁴⁰
- d) Vespasian's head is right instead of left, as on most of Vespasian's Antiochene aes; and
- e) The style is noticeably different.

The style is similar, although not identical, to that of the tetradrachms of group 9.⁴¹ The fact that most of the **SC** bronzes from the second mint are dated **COS IIII**, as are the aurei linked to the group 10

³⁷ See Carradice and Cowell (above, n. 2), pp. 38–43.

³⁸ The reasons for so interpreting the denominations are beyond the scope of this article, but the author hopes to address them in another article on the denominations of the Antiochene aes.

³⁹ See *RPC*, pp. 620–23, and D. B. Waage, *Antioch-on-the-Orontes IV, Part Two, Greek, Roman, Byzantine and Crusaders' Coins* (Princeton, 1952), pp. 31–37.

⁴⁰ The **SC** aes of Domitian dated **COS II** are products of the Roman mint. Carradice and Cowell (above, n. 2), pp. 27, 38–42.

⁴¹ The similarity was noted in Carradice and Cowell (above, n. 2), pp. 42–43, pl. 4, 2–3.

tetradrachms, suggests that the second local *aes* mint is the same mint which produced the tetradrachms of groups 9 and 10 and the **COS IIII aurei** and **denarii**, i.e., the Altar Mint, identified here as Tyre. It is also significant that these bronze coins bear the same distinctive obverse legend as the denarii of Vespasian, **IMP.CAES.VESP.AVG.PM. COS.IIII**.

There is also a very rare smaller denomination *aes* coin, 58, of doubtful authenticity, which may be associated with the second group of **SC** bronze coins. It (if genuine) is a small bilingual bronze of Vespasian (obverse in Latin, reverse with blundered Greek legend) with the same reverse type as the group 10 tetradrachms (eagle on altar). This coin could be the semis counterpart of the **SC** as from the Altar Mint, although its style and epigraphy are rather different, and are closer to the mint of Rome. The die axis is 6:00, which is unusual for local *aes* coinage but typical for coins from the mint of Rome. A metallurgical analysis might confirm or refute its authenticity and permit a more secure attribution, but unfortunately none is available.

If the Altar Mint did, in fact, produce the entire range of denominations discussed above, as well as tetradrachms during years 1 through 5, it must have rivaled Antioch in importance in the Syro-Phoenician area during this period, particularly in the role it played in supporting the Roman legions.⁴² This is consistent with the hypothesis that the Altar Mint was Tyre, the principal city of Phoenicia.

The Orichalcum Coinage

During Vespasian's reign orichalcum coins were struck (probably in Rome) for circulation in Syria (Plates 19–20, 59–89). They were produced in four denominations:

- a) dupondius, featuring winged caduceus between crossed cornucopiae on the reverse;
- b) as, with **SC** in wreath on the reverse;

⁴² Production of imperial coinage in the East was often linked to military requirements: C. J. Howgego, "Coinage and Military Finance: The Imperial Bronze Coinage of the Augustan East," *NC* 1982, pp. 1–20.

- c) semis, with bust of the Tyche of Antioch⁴³ on the reverse; and
- d) quadrans, with winged caduceus on the reverse.

Each denomination was struck bearing the portraits of Vespasian, Titus, and Domitian. Some of the coins of Vespasian and Titus are not dated, but all of those which are, as well as all of the coins of Domitian, can be dated to 74. There are reverse die links between the orichalcum asses of all three emperors,⁴⁴ indicating that the entire group was struck in 74.

The dupondii, semisses, and quadrantes lack the mark **SC** usually seen on aes from the mint of Rome. There is apparent contradiction in the appearance of **SC** on the reverse of the orichalcum asses. The explanation is that the orichalcum asses copied the design which had been used on the Latin-legend asses and semisses of Antioch for almost a century. It seems likely that the design had become practically synonymous with the Roman as and its half, the semis, in the minds of the local populace, and was used, in effect, as a mark of value. This theory is complicated by the existence of a few orichalcum **SC** coins which seem to be semisses, but this can be explained by the following hypothesis: orichalcum asses and semisses were initially struck with the reverse **SC** in wreath to mirror the two traditional Antiochene denominations of that type, but it quickly became apparent that dealing with four different modules of aes (the asses and semisses of leaded bronze struck at Antioch and the orichalcum asses and semisses) was confusing. As a result, the reverse type of the orichalcum semis was changed to a bust of the Tyche of Antioch to differentiate the denomination. It should be stressed that this hypothesis is speculative, but it seems to fit the facts.

It seems highly probable that the four orichalcum denominations were intended to be dupondius, as, semis, and quadrans, because they correspond in module and weight to regular issues in orichalcum from

⁴³ Some coins of semis module and weight instead have **SC** in wreath on the reverse.

⁴⁴ Bankhaus Aufhäuser 4, 7–8 Oct. 1987, 267 (Vespasian) and Schulten and Co., 11–12 Apr. 1988, 379 (Titus); McAlee Coll. = Lanz 44, 16 May 1988, 531 (Vespasian) and Huston FPL 145, May 1996, 21 (Titus); Wruck pl. 5, 97 (Vespasian), and Classical Numismatic Auctions Sale 12, 26 Sept. 1990, 896 (Domitian).

the mint of Rome. The dupondii average 12.5 g,⁴⁵ very close to the average for regular dupondii struck at Rome under Vespasian.⁴⁶ The asses average ca. 6.5 g.⁴⁷ This is somewhat lower than the overall average for Nero's orichalcum asses,⁴⁸ but the weight standard was reduced towards the end of Nero's reign,⁴⁹ and the weight of the Vespasianic asses is obviously quite consistent with a value of half that of the dupondius. The semisses are somewhat heavy at about 4.5 g⁵⁰ compared to Nero's issues,⁵¹ but there is a great deal of variation in weight in the smaller aes coinage, and the average is quite close to that of Trajan's orichalcum semisses⁵² (which were also struck for use in Syria). The quadrantes average about 3 g,⁵³ again somewhat heavy compared to Nero's issues,⁵⁴ but within the upper range of the highly variable denomination.⁵⁵

Equally important as the metrological evidence, the four denominations have a clear visual relationship to one another within the framework of a single issue. Each denomination is distinguishable by both its size and reverse type,⁵⁶ and all are thematically related to Syria: the Tyche of Antioch on the semis; the SC in wreath on the as, long associated with Antioch; the winged caduceus between crossed cornucopiae on the dupondius, previously used on the Tiberian dupondii of

⁴⁵ The average weight of 18 specimens (7 from *BMCRE* and 11 from catalogues) is 12.50 g.

⁴⁶ The average weight of 35 specimens is 12.86 g. *BMCRE*, p. xvi.

⁴⁷ The average weight of 15 specimens from catalogues is 6.44 g.

⁴⁸ The average weight of 16 specimens is 8.42 g. *BMCRE* 1, p. lv.

⁴⁹ D. W. MacDowall, *The Western Coinages of Nero*, ANS, NNM 161 (New York, 1979), p. 82, and Table 7 at p. 253.

⁵⁰ The average weight of 22 specimens is 4.44 g. Wruck, p. 132.

⁵¹ The average weight of 43 specimens is 3.62 g. *BMCRE* 1, p. lvi.

⁵² The average weight of 16 specimens is 4.41 g. W. E. Metcalf, "A Note on Trajan's Latin Aes from Antioch," *ANSMN* 22 (1977), pp. 67-70, esp. p. 70, n. 11.

⁵³ The average weight of 8 specimens (4 from *BMCRE* 1 and 4 from catalogues) is 2.94 g.

⁵⁴ The average weight of 12 specimens is 2.10 g. *BMCRE* 1, p. lvi.

⁵⁵ MacDowall (above, n. 49), p. 253, Table 8 (frequency table ranging from 1.25 g to 3.00 g).

⁵⁶ With the exception of the rare SC semisses noted above.

Commagene,⁵⁷ which was incorporated into the province of Syria by Vespasian in 72;⁵⁸ and the same winged caduceus on the quadrans.

The likelihood that these coins were minted in Rome was established by Carradice and Cowell. They demonstrated that the coins were made of an orichalcum alloy indistinguishable from that found in coins manufactured at Rome during the same period, and that the local SC coins were made of a very different alloy of bronze or leaded bronze.⁵⁹ They also noted similarities between the orichalcum coins and those minted at Rome in portraiture, lettering, and die axis, which also distinguished them from the local issues.⁶⁰

This Flavian orichalcum issue has been poorly understood in the past, and this article in the first publication in which the four denominations have been treated as a single issue. Until recently, the dupondii and quadrantes were considered to be the product of a Commagene mint,⁶¹ the asses were attributed inconsistently to Commagene or Antioch,⁶² and the semisses were considered to be a municipal or provincial issue of Antioch.⁶³ Carradice and Cowell shed a great deal of light on the Roman origin of the coins, but continued to treat the "Commagene" coins separately from the "Antiochene" coins.⁶⁴ The four denominations should, however, be considered parts of a single issue struck in Rome for circulation in Syria. While the experiment did not supersede the locally produced aes, it set a precedent which was repeated under Trajan and Hadrian.⁶⁵

⁵⁷ *RPC*, p. 574.

⁵⁸ *CAH* 11, p. 608.

⁵⁹ Carradice and Cowell (above, n. 2), pp. 35–46, and p. 47, Table 4.

⁶⁰ Carradice and Cowell (above, n. 2), pp. 27 and 41.

⁶¹ *RIC* 2, pp. 4 and 109–12.

⁶² *RIC* 2, pp. 109–12; *BMCGalatia*, p. 177.

⁶³ G. Macdonald, "The Pseudo-Autonomous Coinage of Antioch," *NC* 1904, pp. 105, 123–24; Wruck, pp. 125–26.

⁶⁴ Carradice and Cowell (above, n. 2), pp. 27–29.

⁶⁵ *RIC* 2 Trajan 644–50, 684; *RIC* 2 Hadrian 680–86, 688. See also M. Grant, "Asses of Orichalcum," *ANSCent*, pp. 285–302. For evidence that the orichalcum asses and semisses of Trajan circulated in Syria, see Metcalf (above, n. 52).

CATALOGUE

Varieties illustrated in Plates 15–20 are marked with an asterisk. For metrological information about the silver coinage, see Walker (above, n. 2). For metrological information about the aes coinage, see Carradice and Cowell (above, n. 2). The die axis for all coins is normally 12:00 except for the orichalcum issues, for which it is normally 6:00. The stated rarity of the coins is based on the number of specimens known to the author: extremely rare (1–2); very rare (3–6); rare (7–12). Types with no reference to rarity are known by more than 12 specimens.

TETRADRACHMS

Group 1: Reverse eagle without wreath in beak standing on thunderbolt.

Obv. **ΑΥΤΟΚΡΑΤ ΚΑΙΣΑ ΟΥΕΣΠΑΣΙΑΝΟΝ**, from lower l. Laureate bust of Vespasian r. wearing aegis.⁶⁶

Rev. **ΕΤΟΥΣ ΝΕΟΝ⁶⁷ ΙΕΡΟΝ Α⁶⁸** from exergue. Eagle without wreath standing on thunderbolt, head r.; to r., palm-branch.

- *1. A.D. 69. Wruck 71, rare.
- *2. *Rev.* **ΙΕΡΟΝ Β**, 69/70. Wruck 75a, rare.
- *3. *Obv.* head instead of bust, no aegis. *Rev.* as 2, 69/70. Wruck 75b, rare.
- *4. As 3, but *rev.* eagle's head l. 69/70. Walker (above, n. 2), 1442,⁶⁹ ex. rare.

⁶⁶ The aegis is of the same type seen on Nero's tetradrachms, i.e., a goat skin around the base of the bust with a snake rising up alongside the neck.

⁶⁷ The form of the letter upsilon varies between V and Y in the reverse inscription, often varying even between different words on the same coin.

⁶⁸ The numeral is in the field to the right of the eagle's head and has a line above it.

⁶⁹ The existence of this variety has not been confirmed by the author.

Group 2: Reverse head of Titus.

Obv. ΑΥΤΟΚΡΑΤ ΚΑΙΣΑ ΟΥΕΣΠΑΣΙΑΝΟΥ, from lower l.
Laureate head of Vespasian r.

Rev. Τ ΦΛΑΥΙ ΟΥΕΣΠ ΚΑΙΣ ΕΤΟΥΣ ΝΕΟΝ ΙΕΡΟΝ Β,⁷⁰ from
lower l. Laureate head of Titus r., star to l.

- *5. 69/70. Wruck 80.
- *6. Rev. no star. McAlee Coll., rare.
- *7. Obv. bust of Vespasian l., with drapery on shoulder,⁷¹ 69/70.
Wruck 81.
- *8. Obv. small bust of Vespasian l., drapery on shoulder, above
eagle, head l., l. wing extended. Rev. lituus instead of star, 69/
70. Wruck 82 (pl. 4, 82),⁷² rare.
- *9. As 8 but star instead of lituus, 69/70.⁷³ Schulten + Co., 2–4 June
1982, 605, rare.
- *10. Obv. ΑΥΤΟΚΡΑ (sic).⁷⁴ Rev. no star, 69/70.⁷⁵ McAlee Coll., v.
rare.⁷⁶

Group 3: Reverse eagle without wreath in beak standing on club.

Obv. ΑΥΤΟΚΡΑΤ ΚΑΙΣΑ ΟΥΕΣΠΑΣΙΑΝΟΥ, from lower l.
Laureate head of Vespasian r.

⁷⁰ The numeral is in the lower right field, below Titus's chin, and has a line above it. It is occasionally poorly cut so as to give the appearance of Δ or Ε, but in fact is always Β. The Τ at the beginning of the legend is sometimes absent.

⁷¹ See *BMCRE*, pl. 19, 14, for an aureus with the same style portrait. *BMCRE* attributes the aureus to Alexandria, but the similarity to the Syrian tetradrachms of this type disproves the attribution.

⁷² Wruck's catalogue describes the type with a star to the left of Titus's head, but Wruck's plate shows a coin with a lituus.

⁷³ There is a die link between a coin of this type in the ANS collection and one of the preceding types, with star instead of lituus, in the author's collection.

⁷⁴ Some of the alphas lack crossbars, and so appear to be lambdas.

⁷⁵ This coin die links to another in group 7, with reverse eagle with wreath in beak on club, crescent between legs. (Plates 15, 10, and 17, 26.) Both coins are in the author's collection.

⁷⁶ There is another specimen in Berlin from the same dies.

Rev. **ΕΤΟVS B⁷⁷ IEPOV**, from lower l. Eagle standing on club, head l.; to l., palm branch.

*11. 69/70. Wruck 79.

12. Obv. lituus in field below Vespasian's chin. Müller 56, 25–26 Sept. 1987, 255, ex. rare.

*13. Rev. **ΕΤΟVS Γ**, 70/1. Wruck 86.

*14. Obv. lituus in r. field below Vespasian's chin.⁷⁸ Rev. as 13, 70/1. *BMC Galatia* 232, rare.

*15. Rev. **ΕΤΟVS Δ**, 71/2. Wruck 87.

*16. Rev. **ΕΤΟVS E**, 72/3. Wruck 90, rare.

*17. Obv. **ΑΥΤΟΚ ΚΑΙΣ ΣΕΒΑ**, in field to lower right, **ΛΓ**.⁷⁹ Rev. **ΕΤΟVS Γ** (Γ in field to l. of eagle's head), 70/1. McAlee Coll. = Schulten and Co., 27–29 Mar. 1990, 588, ex. rare.

Group 4: Reverse eagle with wreath in beak standing on wreath.

Obv. **ΑΥΤΟΚΡΑ ΟΥΕCΠACIANOC KAICAP CEBACTOC**, from below.⁸⁰ Laureate head of Vespasian right.

Rev. Eagle with wreath in beak standing on wreath, head l.; to l., palm branch; in exergue, **ΕΤΟΥC A**.

*18. 69. Wruck 70, very rare.

Group 5: Reverse eagle with wreath in beak standing on wreath, crescent between legs.

Obv. As Group 4.

⁷⁷ The numeral is in the field to the left of the eagle's head, and has a line above it.

⁷⁸ For aurei with similar portraits of Vespasian, see Metcalf (above, n. 2), pl. 37, 6, and *Numismatica Ars Classica* 5, 25 Feb. 1992, 440 (shown here at Plate 18, F).

⁷⁹ The obverse matches those of the Alexandrian tetradrachms of year three in the inscription, the portrait style, and the characteristically Alexandrian form of the date. See J. G. Milne, *Catalogue of Alexandrian Coins* (Oxford, 1927), pp. 11–12. This obverse inscription does not appear on any other Syrian tetradrachms of Vespasian. The inescapable conclusion is that this coin is a hybrid of an Alexandrian obverse die and a Syrian reverse die.

⁸⁰ Some of the A's in the obverse legend have a weak or no crossbar and resemble lambdas.

Rev. As Group 4, crescent between eagle's legs.⁸¹

- *19. 69. McAlee Coll. = Empire Coins Auction 3, 5 May 1985, 185, very rare.

Group 6: Reverse eagle with wreath in beak standing on club, ΑΥΤΟΚΡΑ in obverse legend.

Obv. ΑΥΤΟΚΡΑ ΟΥΕΠΤΑΙΑΝΟC ΚΑΙCΑΡ CΕΒΑCΤΟC, from below. Laureate head of Vespasian r.

Rev. ΕΤΟΥC ΝΕΟΥ ΙΕΡΟΥ Α,⁸² from lower l. Eagle with wreath in beak standing on club, head l.; to l., palm branch.

- *20. 69. Wruck 73, rare.

- *21. *Obv.* ΑΥΤΟΚΡΑΤΩΡ⁸³ ΚΑΙCΑΡ CΕΒΑCΤΟC ΟΥΕΠΤΑΙΑΝΟC, 69. Prieur Coll., ex. rare.

- *22. *Rev.* ΕΤΟΥC ΝΕΟΥ ΙΕΡΟΥ Β,⁸⁴ 69/70. Wruck 76.

- *23. *Rev.* ΕΤΟΥC ΝΕΟΥ ΙΕΡΟΥ Γ, 70/71. Wruck 84, very rare.

- *24. *Obv.* ΑΥΤΟΚΡΑ ΚΑΙCΑ ΟΥΕΠΤΑΙΑΝΟΥ, from lower l.⁸⁵ *Rev.* ΕΤΟΥC ΝΕΟΥ ΙΕΡΟΥ Β, 69/70. Wruck 77, rare.

Group 7: Reverse eagle with wreath in beak standing on club, crescent between legs.

Obv. ΑΥΤΟΚΡΑ ΟΥΕΠΤΑΙΑΝΟC ΚΑΙCΑΡ CΕΒΑCΤΟC, from below. Laureate head of Vespasian r.

Rev. ΕΤΟΥC ΝΕΟΥ ΙΕΡΟΥ Β, from lower l. Eagle with wreath in beak standing on club, head l., crescent between legs; to l., palm branch.

⁸¹ Like the preceding type, some the Α's lack crossbars. Also, on this variety, the letter Κ has very small, light frontal strokes and the letter Ρ has a very small head, so that it is easily mistaken for an l.

⁸² The letter form of epsilon is Ε on the reverse, even though it is € on the obverse.

⁸³ This rare variant does not have the characteristic abbreviation of ΑΥΤΟΚΡΑΤΩΡ, but its style and fabric place it within this group.

⁸⁴ Some variants have V instead of Y, e.g., *BMCPoenicia*, p. 299, 4.

⁸⁵ Stylistically, this variety resembles the tetradrachms of group 7 (with crescent), including having a palm branch with fronds on both sides. It is struck on a smaller flan than the other issues in group 6, and has a smaller head of Vespasian which does not interrupt the legend.

- *25. 69/70. Sear (above, n. 20), 736, rare.⁸⁶
- *26. Obv. **ΑΥΤΟΚΡΑ ΚΑΙΣΑ ΟΥΕΣΠΑΣΙΑΝΟΝ**,⁸⁷ from lower l. Rev. **ΕΤΟΥΣ ΝΕΟΝ ΙΕΡΟΝ Β** 69/70. *BMCGalatia* 229, rare.
- *27. Obv. as 26, but **C** instead of **Σ**, 69/70. Glendining's, 9 July 1986, 77, rare.

Group 8: Reverse eagle standing on palm branch, club in field.

Obv. **ΑΥΤΟΚΡ ΚΑΙΣ ΟΥΕΣΠΑΣΙΑΝΟΝ**, from lower l. Laureate head of Vespasian facing r.⁸⁸

Rev. **ΕΤΟΥΣ Γ ΙΕΡΟΝ**. Eagle with wreath in beak standing on palm branch, head l. to l. upright club.

- 28. 70/71. Wruck 83, rare.
- *29. Obv. **ΟΥΕΣΠΑΣΙΑ**, 70/1. Berlin = Wruck, pl. 4, 83, ex. rare.
- *30. Obv. aegis on l. shoulder, **ΟΥΕΣΠΑΣΙΑΝ**, 70/1. McAlee Coll., rare.
- *31. Obv. **ΑΥΤΟΚΡ ΤΙΤΟΣ ΚΑΙΣ ΟΥΕΣΠ**, from lower left; laureate head of Titus facing right, aegis on l. shoulder.⁸⁹ Rev. **ΕΤΟΥΣ Γ ΙΕΡΟΥ**, from lower left, 70/1 (year three of Vespasian). Wruck 100.

⁸⁶ Sear (above, n. 20), p. 70, cites *BMCGalatia* 227, which does not mention a crescent, however, Sear's 136 (from Oxford) clearly shows the crescent.

⁸⁷ Some of the **As** lack cross bars, and so appear to be lambdas. The form of **upsilon** varies from **V** to **Y**.

⁸⁸ See *RIC* 470 and *BMCRE*, pl. 19, 9 and 11, for aureii with the same style portrait.

⁸⁹ The aegis is sometimes off the flan, but it is present on all the examples seen by the author which have the lower portion of the neck on the flan. There are two styles of head, the first one large and interrupting the legend, the other small, with a continuous obverse legend. The large-head variety is similar in style to the group 8 tetradrachms of Vespasian, while the small-head variety seems to have no exact counterpart in Vespasian's coinage. During 1990 the author saw an unpublished hoard of tetradrachms discovered in Israel which included 16 tetradrachms of Titus, the largest group known to the author. It contained ten of the large-head variety and six of the small-head variety. The object on which the eagle stood was off the flan on most of the coins, but a branch was visible on one of the large-head coins, and leaves could be seen (indicating that the object was a branch) on one of the large-head coins and three of the small-head coins.

- *32. As 31, but obv. **OYΕΣ**, 70/1. McAlee Coll. = Empire Coins Auction 6, 14 Nov. 1986, 206, rare.
- *33. As 31, but obv. **AVTO...OYEC**, from upper right, 70/1. McAlee Coll. = Empire Coins Auction 3, 5 May 1985, 186, very rare.
- *34. Obv. As 31, but **OYΕΣΠ**.⁹⁰ Rev. eagle stands on caduceus, to r. of eagle's head, quiver (?) and bow (?),⁹¹ 70/1. McAlee Coll. = Empire Coins Auction 5, 5 May 1986, 128, very rare.

Group 9: Reverse eagle with wreath in beak standing on club, **ΑΥΤΟΚΡΑΤΩΡ**⁹² in obverse legend.

Obv. **ΑΥΤΟΚΡΑΤΩΡ ΚΑΙCΑΡ CΕΒΑCΤΟC ΟΥΕCΠΑCΙΑΝΟC**, from upper r. Laureate head of Vespasian r.

Rev. **ΕΤΟΥC ΝΕΟΥ ΙΕΡΟΥ Α**,⁹³ from lower l. Eagle with wreath in beak standing on club, head l.; to l., palm branch.

- *35. 69. Wruck 74.⁹⁴
- *36. Rev. (counterclockwise) from the exergue, 69. Berlin, ex. rare.
- *37. Rev. **ΙΕΡΟΥ Β**, 69/70. Wruck 78.
- *38. Rev. **ΙΕΡΟΥ Γ**,⁹⁵ 70/1. Wruck 85, very rare.

Group 10: Reverse eagle standing on altar.

Obv. **ΑΥΤΟΚΡΑΤΩΡ ΟΥΕCΠΑCΙΑΝΟC ΚΑΙCΑΡ CΕΒΑCΤΟC**,

⁹⁰ The style of the bust resembles the second variety (small head) of 31, above.

⁹¹ There are several specimens known with the quiver and bow symbols, but the object which the eagle stands upon is off the flan. It is probable that these coins are also of the caduceus variety. See, e.g., *BMCPhoenicia*, p. cxxxviii.

⁹² The omega in the legend has a distinctive form, a circle with a line below.

⁹³ The form of upsilon varies between Y and V and the form of epsilon varies between Ε and Ε on both the obverse and reverse of this issue.

⁹⁴ Wruck also lists a specimen in Berlin (Wruck 72) with reverse inscription **ΕΤΟΥC ΙΕΡΟΥ Α**. The author has examined casts of the coins in Berlin, and in every case there are traces of the word **ΝΕΟΥ**, or else the area where it would normally appear is off the flan. Wruck 72 is therefore an example of Wruck 74 in which the word **ΝΕΟΥ** is off the flan of the coin.

⁹⁵ The end of the obverse legend, uncertain on Wruck's single example, is confirmed by a specimen in Paris. An example in the author's collection has an obverse legend which appears to end **ΟΥΕCΠΑCΙΑΝ** (omitting **OC** at the end), although this reading is not certain because part of the legend is off the flan.

from lower l. Laureate bust of Vespasian l. with drapery on shoulder.⁹⁶

Rev. ΕΤΟVC ΝΕΟV ΙΕΡΟY Δ from upper r. Eagle standing on garlanded altar, head r.; caduceus in beak, palm branch in r. talon.

- *39. (a) Obv. dotted border, 71/2. Wruck 88.
(b) Obv. bead and reel border,⁹⁷ 71/2. Peus 340, 2 Nov. 1994, 860.
- 40. Obv. CEBA. *Rev.* ΝΕΟV ΙΕΡΟV Ε, 72/3. Wruck 89, rare.
- 41. *Rev.* as 40, 72/3. Jerusalem, ex. rare.⁹⁸

AES

Antioch, bronze

Obv. IMP. CAESAR VESPASIAN. AVG., from lower l. or below bust. Laureate head of Vespasian l.

Rev. SC within laurel wreath.

- *42. As, 28 mm. *BMCGalatia* 216.⁹⁹
- *43. Semis, 20 mm. *BMCGalatia* 218.
- *44. Obv. head r., legend starts from below. As, 28 mm. Wruck 94, v. rare.
- 45. *Rev.* ΕΠΙ ΤΡΑΙΑΝΟΥ¹⁰⁰ ANTIOXEΩN ET ΕΚΡ in five lines within laurel wreath. As,¹⁰¹ 27 mm, A.D. 76. Numismatik Lanz Auktion 22, 10 May 1982, 641, ex. rare.
- *46. Obv. T. CAESAR IMP. PONT. Laureate head of Titus r. As, 28 mm. *BMCGalatia* 235.

⁹⁶ See *RIC* 356–58, and *BMCRE*, pl. 18, 15 and 18, for aurei with the same style portrait.

⁹⁷ This is the first and last occurrence of this style of border, a filleted border, since the Zeus-seated tetradrachms of the Julio-Claudian period.

⁹⁸ This may be no more rare than the preceding variant, but this is uncertain because this portion of the legend is frequently off the flan.

⁹⁹ References to *BMCGalatia* are to the section on Antioch.

¹⁰⁰ The legate referred to is M. Ulpius Trajanus, father of the future emperor Trajan. *BMCGalatia*, p. 180, n.

¹⁰¹ Semisses were probably struck as well, since an example is known for Titus, but none has yet come to light.

- *47. As 46. Semis, 20 mm. *BMCGalatia* 236.
- *48. Obv. as 46. Rev. as 45. As, 28 mm, 76. *BMCGalatia* 239, ex. rare. See addendum for photograph.
- 49. As 48. Semis, 23 mm. *Hunter* 3, 139, ex. rare.
- *50. Obv. **DOMITIANVS CAESAR**, laureate head of Domitian l. As,¹⁰² 28 mm. Sear (above, n. 20), 872.
- *51. As 50. Semis, 20 mm. *BMCGalatia* 251.¹⁰³
- 52. As 50 but **N** in **DOMITIANVS** retrograde. Semis, 20 mm. *BMCGalatia* 252, rare.
- *53. As 50, but Domitian's head r. and entire legend retrograde.¹⁰⁴ Semis, 20 mm. Wruck 117, rare.
- *54. As 50. Semis, 20 mm. Wruck 115, rare

Tyre, bronze

Obv. **IMP. CAES. VESP. AVG. P. M. COS. IIII**, from lower l. Laureate head of Vespasian r.

Rev. **SC** within laurel wreath.

- *55. As, 25 mm, 72–73. *BMCGalatia* 221.
- 56. Obv. **VES.** As, 25 mm, 72–73. Edward J. Waddell, Ltd. Inventory, 1990, ex. rare.
- 57. Obv. **COS. V.** As, 25 mm, 74. Wruck 93, ex. rare.
- *58. Obv. **IMP. CAESAR AVG. VESPASIANVS.** Rev. **COV NCPOV Δ**, eagle standing on garlanded altar, head, r.; caduceus in beak, two palm branches. Semis (?),¹⁰⁵ 20 mm, 71/72. *SNGCopAntioch* 170, ex. rare.

¹⁰² Waage (above, n. 39), p. 36, erroneously states that **SC** bronzes of Domitian as Caesar "occur only in the second denomination," i.e., the semis.

¹⁰³ The portrait of Domitian on this issue sometimes resembles Nero, and the coins are not infrequently misattributed to Nero. See, e.g., *SNGCopAntioch* 162.

¹⁰⁴ It seems that the obverse die was engraved as the mirror image of its intended design, perhaps by an inexperienced die cutter who copied a coin without reversing the design.

¹⁰⁵ *SNGCop* 170 weighs 3.31 g, which is substantially below the range normally encountered for the **SC** semisses. The author has not seen either of the two known specimens (in Copenhagen and Vienna), and Michel Amandry (personal communication) believes that they are modern forgeries.

Rome, Orichalcum¹⁰⁶

Obv. **IMP. CAESAR VESPASIAN. AVG.**¹⁰⁷ Laureate head of Vespasian r.

Rev. **PON. MAX. TR. POT. P. P. COS. V. CENS.** Winged caduceus between crossed cornucopiae.

- *59. Dupondius, 26 mm, 74. *RIC* 798(a)
- *60. *Obv.* head l. Dupondius, 26 mm, 74. *RIC* 798(b).
- 61. *Obv.* as 60, but **VESPASIANVS**. Dupondius, 26 mm, 74. *RIC* 798(c).
- 62. *Obv.* **VESPASIANVS** Dupondius, 26 mm, 74. *BMCRE* 887.
- *63. *Obv.* **VESP.**, head l. *Rev.* **SC** within laurel wreath. As, 22 mm. *RIC* 796.
- 64. As 63, but head r. As, 22 mm. Wruck 96, ex. rare.
- 65. As 63. Semis,¹⁰⁸ 20 mm. Gorny 30, 19–20 Nov. 1984, 2690, v. rare.
- *66. *Obv.* **IMP. VESP. AVG. P. M. T. P.** *Rev.* as 63. Semis or as,¹⁰⁹ 20 mm. *BMCRE* 879, v. rare.
- *67. *Obv.* as 66. *Rev.* **ANTIOCHIA**. Towered and laureate bust of the Tyche of Antioch r. Semis, 20 mm. Wruck 98.
- *68. As 67 but head of Vespasian l. Semis, 20 mm. Wruck 99, rare.
- 69. *Obv.* **IMP. VESP. AVG.** Laureate head of Vespasian l. *Rev.* **P. M. TR. POT. P. P.** Winged caduceus, upright. Quadrans, 15 mm. *RIC* 794, v. rare.
- *70. As 69 but *Rev.* **VESP. PON. TR. P.**¹¹⁰ Quadrans, 15 mm. McAlee Col. = Hirsch 160, 23–25 Nov. 1988, 413, ex. rare.

¹⁰⁶ For metallurgical analyses and comparisons with local coinage, see Carradice and Cowell (above, n. 2).

¹⁰⁷ The punctuation is not consistent, but periods are often present on the orichalcum coins.

¹⁰⁸ There is a fairly wide range of sizes for the as (ca. 20 mm – ca. 23 mm), so this may be one at the lower end of the range, but the size of the types is markedly smaller than those found on the asses, and corresponds to those found on the **ANTIOCHIA** semisses.

¹⁰⁹ The obverse die is from the following type (a semis), but the weight is closer to that of an as (*BMCRE* 879, 6.14 g; McAlee Coll., 6.43 g).

¹¹⁰ This appears to be a hybrid with the reverse of the Titus quadrans of the same type.

- *71. Obv. **T. CAESAR IMP. PONT.** Laureate head of Titus r. Rev. **TR. POT. COS. III CENSOR.** Winged caduceus between crossed cornucopiae. Dupondius, 26 mm, 74. *RIC* (Vespasian) 813 (a).
- 72. As 71 but head l. Dupondius, 26 mm, 74. McAlee Coll., rare.
- 73. As 71 but **CAES.** Dupondius, 26 mm, 74. *RIC* (Vespasian) 813 (b). (Not confirmed, probably a misreading of 71.)
- 74. As 73 but head l. Dupondius, 26 mm, 74. *RIC* (Vespasian) 813 (c). (Not confirmed, probably a misreading of 72.)
- 75. As 71 but obv. **IMP. COS. III CENS.** Dupondius, 26 mm, 74. *RIC* (Vespasian) 813 (d), ex. rare.
- *76. As 71 but rev. **PON. MAX. TR. POT. P. P. COS V CENS.** Dupondius, 26 mm, 74.¹¹¹ *RIC* (Vespasian) 814, ex. rare.
- *77. As 71 but **T. CAES. IMP. TR. POT.** Rev. **SC** in laurel-wreath. As, 22 mm. *RIC* (Vespasian) 804.
- 78. As 77 but **IMP. PON. TR. POT.** As, 22 mm. *RIC* (Vespasian) 805. (Not confirmed, probably a misreading of 79.)
- 79. As 78 but **CAESAR** As, 22 mm. *RIC* (Vespasian) 806, ex. rare.
- *80. As 77 but rev. **ANTIOCHIA.** Towered and laureate head of the Tyche of Antioch r. Semis, 20 mm. Wruck 104.
- 81. Obv. **T. CAES. IMP.** Laureate head of Titus r. Rev. **PON. TR. POT.** Winged caduceus. Quadrans, 15 mm. *RIC* (Vespasian) 807, ex. rare.
- 82. As 81 but rev. **VESP. PON. TR. P.** Quadrans, 15 mm. *RIC* (Vespasian) 808, ex. rare.
- *83. As 81 but obv. **CAESAR** and rev. **P.M. TR. POT. P.P.** Quadrans, 15 mm. McAlee Coll. = Numismatica Ars Classica, 16 Nov. 1994 (Steinberg), 306, ex. rare.
- *84. Obv. **CAESAR AVGVSTI F.** Laureate head of Domitian l. Rev. **DOMITIANVS COS. II.** Winged caduceus between crossed cornucopiae. Dupondius, 26 mm, 74.. *RIC* (Vespasian) 816, rare.
- *85. As 84 but obv. **CAESAR DOMIT. COS II** and rev. **SC** within laurel wreath. As, 22 mm, 74. *RIC* (Vespasian) 817.
- *86. As 85 but head r. As, 22 mm. McAlee Coll. = Classical Numismatic Auctions 12, 26 Sept. 1990, 896, ex. rare.

¹¹¹ This is a hybrid with an obverse of Titus and a reverse of Vespasian. The **COS V** refers to Vespasian, not Titus, and the coin dates to 74, not 76.

- *87. As 85. Semis, 20 mm. *BMCRE* 884.¹¹²
- *88. As 85 but rev. **ANTIOCHIA**. Towered and laureate bust of Antiochia r. Semis, 20 mm, 74. *Wruck* 113, rare.
- *89. Obv. **CAES. AVG. F.** Laureate head of Domitian l.¹¹³ Rev. **DOMIT. COS II.** Winged caduceus. Quadrans, 15 mm, 74. *RIC* (Vespasian) 818, rare.

ADDENDUM

While this article was in the final stages of preparation, the author acquired an unpublished and apparently unique aes coin of Vespasian which permits the addition of two other provincial aes types which were probably minted at Tyre. The description of the unpublished coin is as follows:

- A. *Obv.* **ΑΥΤΟΚΡΑΤΩΡ ΚΑ ΟΥΕΣΠΑΣΙΑΝΟΣ ΣΕΒΑ**, from upper r. Laureate head of Vespasian r.
- Rev.* **ΕΤΟΥΣ** (in vertical line to l.) **Α** (horizontally in r. field). Garlanded altar with three horns, the two outer horns curving inward, the central horn curving to the left.
- Semis, 21 mm, 5.6 g, 12:00 axis.

The following published¹¹⁴ but unattributed coin is clearly the larger denomination of the same issue because the legends are almost identical (including the positions of the words in the obverse legend), the style of the portrait is identical, and the distinctive forms of the letters¹¹⁵ are identical:

¹¹² As in the case of Vespasian's coins of this type, there is a fairly wide range of sizes for the as (ca. 20–23 mm), and this may be one at the lower end of the range. However, the flan module and the size of the types are consistent with those of the semisses, as is the weight (*BMCRE* 884, 5.12 g.; McAlee Coll., 4.98 g.)

¹¹³ *RIC* describes the coin as head right, but this is an error: all the specimens seen by the author have head left. See, e.g., *BMCRE*, pl. 43, 2.

¹¹⁴ *SNGvAulock* 6673.

¹¹⁵ The epsilons and sigmas are squared rather than lunate, Y is used rather than V, the omega Ω rather than ω, and in particular, the A has an archaic form in which the crossbar is V-shaped rather than linear.



B. *Obv.* As above, but **KAI** instead of **KA**.

Rev. **ΕΤΟΥΣ Α** within laurel wreath.

As, 28 mm, ca. 12 g, 12:00 axis.

Both coins are dated "Year One," i.e. the first year of Vespasian's reign, A.D. 69.

There are at least three cities for which coins are known with a three-horned altar as a symbol: Mopsus, Byblus, and Tyre.¹¹⁶ But the altars on the coins of Mopsus and Byblus are shown with legs, while the one on the coins of Tyre (and the one on the coin described here) has a flat base. More importantly, the civic coins of Tyre struck under Vespasian have the same distinctive letter-forms¹¹⁷ as these coins, including the archaic **A**. It seems likely, therefore, that Tyre was the mint which struck these Greek-legend provincial aes for Vespasian soon after his accession.

¹¹⁶ Mopsus, *SNGLevante* 1332-34; Byblus, *BMCPHOENICIA* 37-38; Tyre, *BMCPHOENICIA* 404-5, *SNGCop* 366.

¹¹⁷ *SNGCop* 334-35. Similar letter forms also appear on contemporaneous coins of Sidon.

COINS FROM THE EXCAVATIONS AT TELL NIMRIN

(PLATES 21–22) WILLIAM E. METCALF AND WILLIAM J. FULCO, S.J.

The coins described here were found during the course of excavations at Tell Nimrin. Tell Nimrin is a town situated on the eastern edge of modern Shuna ej-Junubiyyah, Jordan, along the east-west road that runs from Shuna to Sait via the Wadi Shu'aib. In the summer excavations of 1989 and 1990, the earliest occupation was dated to the transitional Early Bronze IV/Middle Bronze I period, ca. 2000 B.C. All periods were represented at the site except for the Late Bronze Age (ca. 1500–1000 B.C.) and possibly a later gap during Iron II (ca. 700–550 B.C.). Other than these times, the site seems to have been inhabited continuously from its foundation down to the present.¹

The excavation was under the direction of James W. Flanagan (Case Western Reserve University), David W. McCreery (Willamette University) and Khair N. Yassine (University of Jordan). The report

¹ For earlier reports on the site see J. W. Flanagan and D. W. McCreery, "First Preliminary Report on the 1989 Tell Nimrin Project," *ADAJ* 34 (1990), pp. 131–52; R. H. Dornemann, "Preliminary Comments on the Pottery Traditions at Tell Nimrin, Illustrated from the 1989 Season of Excavations," *ADAJ* 34 (1990), pp. 153–81; J. W. Flanagan, D. W. McCreery, and K. N. Yassine, "Preliminary Report of the 1990 Excavation at Tell Nimrin," *ADAJ* 36 (1992), pp. 89–111. A list of abbreviations used in this article follows the article.

on the solidi was prepared by Metcalf, that on the other coins by Fulco.

THE SOLIDUS HOARD

A hoard of 34 solidi and four pendant earrings, all contained in a small trefoil mouth terracotta juglet, was excavated by director Flanagan on May 30, 1993.² The findspot was approximately 10 cm above the floor associated with walls that shielded the find on two sides, and about 65 cm below the preexcavation elevation of the spot. It was on the northern crest of the mound above and on the edge of the road cut that marks the north boundary of the present site.

The 34 solidi range in date from Valentinian I and Valens (A.D. 364–67) to Anastasius I (A.D. 491–518). The coins fall into two neatly demarcated groups.

Valens (364–67, all Antioch)	8
Valentinian I (374–76, all Antioch)	11
Leo I (457–73, all Constantinople)	3
Basiliscus and Marcus (475–76, Constantinople)	1
Zeno (476–91, 5 Constantinople, 2 Thessalonica, 1 western)	8
Anastasius I (491–518, all Constantinople)	3

The latest coins are of the reign of Anastasius, and are of the Victory with voided cross reverse type, attributed by Bellinger to the years before 498, by Hahn to the period 492–507.³ One of the two has been gouged, but the other two (at 4.47 and 4.51 gm) are among the heaviest in the hoard and have seen virtually no wear. The coins

² The juglet and earrings will be published elsewhere; the earrings are currently under study by Gary Vikan of the Walters Art Gallery, Baltimore.

³ A. R. Bellinger and P. Grierson, eds. *Catalogue of the Byzantine Coins in the Dumbarton Oaks Collection and in the Whittemore Collection* (Washington, 1966–), vol. 1, *Anastasius I-Maurice Tiberius* (Bellinger, 1966, repr. 1992), 3; W. Hahn, *Moneta Imperii Byzantini* 1 (Denkschriften der Oesterreichischen Akademie der Wissenschaften, Phil.-hist. Klasse 109, Vienna, 1973), 4.

taken alone would suggest a date very near the turn of the sixth century A.D.

In chronological outline the hoard is similar to two hoards from the synagogue at Ḥorvat Rimmon.⁴ As Grierson and Mays have noted, both of these are unusual in containing fractional gold.⁵ The value of the Tell Nimrin hoard, at 34 nominal (about 32½ actual) solidi (plus jewellery) is considerably greater than the other two, Ḥorvat Rimmon I having a total of 3 solidi, 2 semisses, and 7 tremisses (total nominal weight 6⅓ solidi, total actual weight approximately 5¾ solidi), and Ḥorvat Rimmon II 1 solidus, 9 semisses, and 25 tremisses for a total nominal weight of 13⅝ solidi (total actual weight just over 13 solidi).

The biggest surprise is the appearance of the Thessalonican solidi of Zeno (29–30) and the one western issue bearing his name and presumably struck at one of the Ostrogothic mints of the west (31). A comparable coin which has not been attributed satisfactorily turned up in the Vedrin hoard, but neither Lallemand nor Ulrich-Bansa before her were willing to hazard a mint attribution.⁶

It is tempting to see the Tell Nimrin hoard as a combination of two separate hoards; one, including the coins of Valens and Valentinian, 1–19, formed in the fourth century, and the other, the later coins, added in the late fifth or early sixth century. The fact that three coins of Valentinian I share the same reverse die seems to support this view, but caution is in order: both Ḥorvat Rimmon hoards include fourth century coins, and we know so little about coin supply

⁴ A. Kloner and T. Mindel, "Two Byzantine Hoards from the Ancient Synagogue of Ḥorvat Rimmon," *INJ* 5 (1981), pp. 60–68.

⁵ P. Grierson and M. Mays, *Catalogue of Late Roman Coins in the Dumbarton Oaks Collection and in the Whittemore Collection. From Arcadius and Honorius to the Accession of Anastasius* (Washington, 1992), p. 285, where the total weight of Ḥorvat Rimmon II is calculated incorrectly.

⁶ J. Lallemand, "Vedrin: sous d'or de Magnus Maximus à Anastase," in *Bibliothèque royale de Belgique. Études numismatiques* 3 (1965), pp. 109–44, at p. 143, 58 ("ateliers occidentaux"); O. Ulrich-Bansa, *Moneta Mediolanensis (352–498)* (Venice, 1949), p. 343, with plate O, v ("stile italiano"). G. Lacam, who attributes the issue to Rome, illustrates five similar specimens at *La fin de l'empire romain et le monnayage or en Italie* (Lucerne, 1983), vol. 2, pl. CXCI.

in Palestine during the fifth century that no such firm conclusion can be drawn.

Virtually all the coins show scratches, mostly straight lines that suggest graffiti, and one coin of Zeno (21) shows traces of paint.

CATALOGUE

Valens

Antioch

Obv. **DNVALENS—PERFAVG** Bust, pearl diademed, draped, cuirassed r.

Rev. **RESTITVTOR—REIPVBLICAE** Emperor standing, facing, head r., holding standard with cross in r. and Victory on globe in l. In exergue variants of mint mark **ANIA**.
In l. field, large cross.

1. 4.31 5 ***ANTA*** *RIC*, 2d, xxxvii, 1.
2. 4.04 5 ***ANTA*** *RIC*, 2d, xxxvii, 1.
3. 4.33 6 ***ANTΔ*** *RIC*, 2d, xxxvii, 4.
4. 4.32 6 ***ANTE*** *RIC*, 2d, xxxvii, 5.
Similar, but * in standard.
5. 4.39 5 ***ANTI*** *RIC*, 2d, xxxvii, 6.
Similar, but nothing in l. field and **✠** in standard.
6. 4.34 6 **ANTB.** *RIC*, 2d, xiii, 2.
Similar, but chrismon in l. field and in standard.
7. 4.34 5 **ANTA** *RIC*, 2d, x.
Similar, but standard obscure.
8. 4.36 6 ***ANTA*** *RIC*, 2d.

Valentinian I

Antioch

Obv. **DNVALENTINI—ANVSPFAVG** Bust, rosette diademed, draped, cuirassed r.

Rev. **RESTITVTOR—REIPVBLICAE** Emperor standing facing, head r., holding standard with cross in r. and Victory on globe in l. In exergue variants of mint mark **ANTA**.

In field l., large cross.

- | | | | |
|-----|------|---|--------------------------------------------|
| 9. | 4.52 | 5 | *ANTA* <i>RIC</i> , 2b, xxxviii, 1. |
| 10. | 4.30 | 5 | *ANTA* <i>RIC</i> , 2b, xxxviii, 1. |
| 11. | 4.29 | 5 | *ANTA* <i>RIC</i> , 2b, xxxviii, 1. |
| 12. | 4.38 | 5 | *ANTB* <i>RIC</i> , 2b, xxxviii, 2. |
| 13. | 4.34 | 5 | *ANTT* <i>RIC</i> , 2b, xxxviii, 3. |
| 14. | 4.31 | 5 | *ANTΔ* <i>RIC</i> , 2b, xxxviii, 4. |
| 15. | 4.38 | 6 | *ANTΔ* <i>RIC</i> , 2b, xxxviii, 4. |

Similar, but star in standard.

- | | | | |
|-----|------|---|-----------------------------------------------------------------|
| 16. | 4.43 | 6 | *ANTI* <i>RIC</i> , 2b, xxxv. <i>Rev.</i> die of 17–18. |
| 17. | 4.39 | 6 | *ANTI* <i>RIC</i> , 2b, xxxv. <i>Rev.</i> die of 16, 18. |
| 18. | 4.21 | 6 | *ANTI* <i>RIC</i> , 2b, xxxv. <i>Rev.</i> die of 16–17. |

Similar, but chrismon in l. field and cross in standard.

- | | | | |
|-----|------|---|----------------------------------------------------------------|
| 19. | 4.39 | 5 | ANTB <i>RIC</i> , 2b, ix. <i>Officina</i> not recorded. |
|-----|------|---|----------------------------------------------------------------|

Leo I

Constantinople

Obv. **D N LEO PE—RPET AVG** Armored bust three-quarters facing, spear over r. shoulder.

Rev. **VICTORI-A AVCCC** with (20–21) or without (22) *officina* numeral. Victory standing l. holding long cross; in field r., star. In exergue, **CONOB**.

- | | | | |
|-----|------|---|-----------------------------------------------------|
| 20. | 4.41 | 6 | At end, B . <i>RIC</i> 10, 605. |
| 21. | 4.47 | 6 | At end, l. <i>RIC</i> 10, 605. |
| 22. | 4.46 | 6 | No numeral at end. <i>RIC</i> 10, 605. ⁷ |

⁷ Leo's *solidi* with **VICTORIA AVCCC** and without *officina* numeral are described by Kent (*RIC* 10, p. 101) as "exceptionally rare": he cites only Leu 15, 4 May 1976, 431. That coin is of completely different style.

Basiliscus and Marcus

Marcus as Augustus, autumn 475 – August 476

Constantinople

Obv. **D N BASILISCI—E MARC P AVC** Armored bust three-quarters fcg., spear over r. shoulder.

Rev. **VICTORI—A AVCCC** and officina numeral. Victory stg. l. holding long cross; in field r., star. In ex., **CONOB.**

23. 4.30 6 At end, **Γ**. *RIC* 10, 1024.

Zeno

Obv. **D N ZENO—PERP AVG** Armored bust three-quarters facing, spear over r. shoulder.

Rev. **VICTORI—A AVCCC** and officina numeral. Victory standing l. holding long cross; in field r., star. In exergue, **CONOB.**

Constantinople

24. 4.49 6 At end, **A**. *RIC* 10, 910.

25. 4.23 6 At end, **B**. *RIC* 10, 910.

26. 4.43 6 At end, **Δ**. *RIC* 10, 910.

27. 4.17 6 At end, **H**. *RIC* 10, 910.

28. 4.30 6 At end, **I**. *RIC* 10, 910.

29. 4.20 6 At end, **TE**. *RIC* 10, 927.⁸

Obv. Similar.

Rev. Similar but no officina numeral and star to l. and r. of Victory.

⁸ We follow here Kent's attribution to Constantinople, rather than that of Grierson and Mays to Thessalonica; see Kent, *RIC* 10, p. 117; Grierson and Mays (above, n. 5), p. 184.

Thessalonica

30. 4.24 6 "Boldly dotted borders."⁹ *RIC* 10, 941.

Uncertain Western Mint

Obv. D N ZENO P—ERP F AVC (Z reversed); similar type.

Rev. VICTORIA A—VCCC and officina mark. Victory standing l. holding long cross; in field r., star. In exergue, COMOB.

31. 4.29 6 At end, ∴. Cf. *RIC* 10, 3651.¹⁰

*Anastasius I**Constantinople*

Obv. D N ANASTA—SIVS P P AVC Armored bust three-quarters facing, spear or r. shoulder.

Rev. VICTORI—AAVCCC and officina numeral; Victory standing l. holding long cross; in field r., star. In exergue, CONOB.

32. 4.51 6 At end, Γ.

33. 4.47 6 At end, I.

34. 4.26 6 At end, I.

(gouged)

THE SILVER AND COPPER COINS

Although the major numismatic find from Tell Nimrin was the hoard of solidi described above, some two dozen additional coins have

⁹ For these borders cf. D. M. Metcalf, "The Minting of Gold Coinage at Thessalonica in the Fifth and Sixth Centuries and the Gold Currency of Illyricum and Dalmatia," in W. Hahn and W. E. Metcalf, eds., *Studies in Early Byzantine Gold Coinage* (Numismatic Studies 17, New York, 1988), 222 and 228. The "boldly dotted" dies seem invariably to be paired with one another.

¹⁰ The attribution of the coin is uncertain. Pointing to western origin are the obverse legend, the use of COMOB on reverse, and the termination of the reverse legend with ∴, which occurs certainly at Rome and Ravenna. The style of our piece is closest to that illustrated by Ulrich-Bansa (above, n. 6) at pl. 0, v.

been found at the site. The exceptional condition of the tetradrachm of Antioch, 7, is in contrast to the poor preservation of most of the remaining coins.

Alexander Jannaeus, 103–76 B.C.

<i>No.</i>	<i>Mint</i>	<i>Denomination</i>	<i>Size/Wt.</i>	<i>Obverse</i>	<i>Reverse</i>	<i>Reference</i>
1.	Jerusalem	Lepton	12/14	Anchor	Star	<i>AJC</i> 1, p. 69, Calff.; <i>JC</i> 8.
2.	Jerusalem	Lepton	12	Anchor	Star	<i>AJC</i> 1, p. 69, Calff.
3.	Jerusalem	Lepton	17	Anchor	Star	<i>AJC</i> 1, p. 69, Calff.
4.	Jerusalem	Lepton	12	Anchor	Star	<i>AJC</i> 1, p. 69, Calff.

Procurators under Nero: Festus, A.D. 59–62

5.	Jerusalem	Lepton	13/15	[NEP]/ ΩNO/C	Palm branch LE (= year 5, A.D. 59).	<i>AJC</i> 2 Suppl. V, D 35; <i>JC</i> 234.
----	-----------	--------	-------	-----------------	-------------------------------------------------	---------------------------------------------------

Uncertain Jewish

6.	Uncertain	Lepton	12	obscure	obscure	—
----	-----------	--------	----	---------	---------	---

Nero, A.D. 54–68

7.	Antioch	Tetradrachm	24 13.22 gm.	NEPΩN ΣΕΒΑΣΤΟΣ Head laureate r.	ΕΤΟΥΣ ΚΑΙΣΑΡ ΒΙΡ-Ι (year 112 = A.D. 63) eagle r. on thunderbolt (Plate 22, A)	Wruck 46 in exergue,
----	---------	-------------	-----------------	------------------------------------------	----------------------------------------------------------------------------------------------------	-------------------------

Septimius Severus, A.D. 193–211

8.	Rome	Denarius	20	SEVERVS PIVS AVG Head r.	P M TR P XVII COS III P P Salus standing l. feeding snake (A.D. 209) (Plate 22, B)	<i>RIC</i> 4, p. 120, 230.
----	------	----------	----	--------------------------------	------------------------------------------------------------------------------------------------------	-------------------------------

House of Constantine

9.	Uncertain	Nummus	15	D N CONSTAN- TINVS F AVG Head diademed r.	VOT XX/ MVLT XXX in wreath	—
10.	Uncertain	Nummus	13/15	Obscure	Obscure	—
11.–12.	Uncertain	Nummi ¹¹	12	Obscure	Obscure	—

House of Valentinian

13.	Thessalonica	AE3	10/12	Obscure	Camp gate	<i>RIC</i> 9, 59 (A.D. 384–88)
-----	--------------	-----	-------	---------	-----------	--------------------------------------

Uncertain Fourth Century

14.	Uncertain	AE4	11	Obscure	Obscure	—
15.	Uncertain	AE4	9/10	Head r.	Obscure	—

Byzantine

16.	Constantinople	Follis	29	Justin II and Sophia seated	M; to l., ANNO; to r., or	<i>DOC</i>
-----	----------------	--------	----	-----------------------------------	---------------------------------	------------

¹¹ Two coins fused together. All types are obliterated except traces of a legend on the obverse of the smaller coin; they are doubtless late Roman Æ4 of the late fourth or early fifth century.

17. Constantinople Follis 27 Justin II M; beneath, *DOC*
and Sophia Γ; to l.,
seated ANNO;
to r., X

Umayyad

- | | | | | | | |
|-----|-----------|------|----|-----------------------------------------|--------------------------|------------------------|
| 18. | Uncertain | Fals | 17 | Kalima | Kalima | Mitchener,
WI 73ff. |
| 19. | Uncertain | Fals | 24 | Kalima | Kalima | " |
| 20. | Uncertain | Fals | 25 | Kalima | Kalima | " |
| 21. | Ramla | Fals | 17 | First part
of kalima | Second part
of kalima | Mayer
IC 57. |
| 22. | Uncertain | Fals | 20 | Obscure
(traces of
Arabic legend) | Obscure | — |

ABBREVIATIONS

AJC: Y. Meshorer, *Ancient Jewish Coinage 1, Persian Period through Hasmonaeans; 2, Herod the Great through Bar Cochba* (Dix Hills, NY, 1982).

DOC: A. R. Bellinger and P. Grierson, eds., *Catalogue of the Byzantine Coins in the Dumbarton Oaks Collection and in the Whittemore Collection* (Washington, 1966-).

JC: Y. Meshorer, *Jewish Coins of the Second Temple Period* Jerusalem, 1967).

Mayer IC: A. Berman, *Islamic Coins. L. A. Mayer Memorial Institute for Islamic Art Exhibition Winter 1976* (Jerusalem, 1976).

RIC: H. Mattingly, E. A. Sydenham et al., eds., *The Roman Imperial Coinage*, vol. 9, *Valentinian I - Theodosius I* (1951) and vol. 10, *The Divided Empire and the Fall of the Western Parts* (1994).

WI: M. Mitchener, *The World of Islam: Oriental Coins and their Values* (London, 1977).

Wruck: W. Wruck, *Die syrische Provinzialprägung von Augustus bis Traian* (Stuttgart, 1931).

TWO SILVER COINS OF GOSDANTIN III OF CILICIAN ARMENIA

(FIGS. 1 AND 2)

Y. T. NERCESSIAN

Roupen I (1080-95), a prince of the Armenian Bagratid kingdom, laid the foundation of the Roupenian dynasty. After him, eight barons and 16 kings ruled on the throne of Cilician Armenia for a period of three centuries. Baron Levon II, for his invaluable services to the third Crusade, was crowned as King Levon I by the Imperial Chancellor Conrad of Mainz and the Catholicos Gregory Abirad on 6 January 1198. The medieval kingdom of Cilician Armenia achieved great successes in the cultural, political, military, and economic fields while Kings Levon I (1198-1219) and Hetoum I (1226-70) were in power.¹

With the coronation of King Levon II, Hetoum's son, it was apparent that a decline had started in the power of Crusader principalities and also in Cilician Armenia. For the next hundred years some of the Armenian kings paid tribute to the Mamluks of Egypt in order to save the kingdom.²

When King Levon IV died, the male line of the Roupenian and Hetoumian dynasty came to an end. Guy de Lusignan, who was

¹ For a general survey, see S. Der Nersessian, "The Kingdom of Cilician Armenia," *A History of the Crusades*, ed. K. M. Setton (Philadelphia, 1962), vol. 2, pp. 630-59.

² J. de Morgan, *The History of the Armenian People* (Boston, 1965), p. 240.

related to the Cilician Armenian royal house, was chosen as the successor of Levon IV. Guy endeavored to bring a union between the Armenian and Roman churches in the hope of receiving military and financial assistance from western Europe. During a riot, Guy and his Frankish body guards were killed by Armenian nationalists.³

The Armenian nobles then elected Gosdantin III (1344–63), the son of Marshal Baldwin of Neghr. The new monarch was not a descendent of the Roupenian and Hetoumian lines but he was related to the royal house through his marriage with Marie, the daughter of Oshin Baille and Jeane of Anjou.⁴ His position was unenviable as the Armenians were constantly forced to battle their enemies. The seaport of Ayas was lost and the situation was growing worse day by day. Thanks to the support of the Grand Master of Rhodes, Gosdantin succeeded in recapturing Ayas in 1347, but lost it permanently the following year. In 1360, the Egyptian Sultan Malik al-Nasir invaded Cilicia and carried away an immense quantity of booty. The Muslims of Karaman besieged the port of Gorigos which was rescued by King Peter I de Lusignan of Cyprus. Gosdantin III died in 1363 without leaving an heir.⁵

In the Middle Ages, in Western Europe, most coin dies were created by using punches for various features. According to a detailed study by P. Z. Bedoukian, Armenian coins of the period were struck. A positive or mother die was first engraved in hard metal. Negatives or working dies were manufactured in soft metal from this positive die. Then, the working dies were hardened by tempering. In this way several thousand obverses or reverses could be struck from one working die.⁶ The obverse die was fitted on an anvil. The reverse die was fitted into the base of a punch or trussel. Blanks of gold, silver, or copper were cast or cut from sheet metal which was then carefully weighed, trimmed to shape or to bring the weight within designated limits, heated, placed between obverse and reverse dies,

³ De Morgan, p. 250.

⁴ De Morgan, p. 253–55; *Armenian Encyclopedia* 5 (Erevan, 1969), pp. 613–14 (in Armenian).

⁵ De Morgan, p. 255; *Armenian Encyclopedia*, p. 614.

⁶ P. Z. Bedoukian, "Minting Technique in Cilician Armenia," *Armenian Numismatic Journal (ANJ)* 19 (1993), pp. 49–57.

and struck with a heavy hammer on the back of the upper die. The hammer's heavy blow would force the hot malleable metal to flow into the dies, take the shape of the die, and produce a coin.

Gosdantin III issued two types of coins, a debased silver piece known as the takvorin and a small copper known as the pogh.⁷ During his reign, coins were struck in two mints, Sis and Tarsus. The names of both mints are inscribed on the silver and copper coins.⁸ The silver coins portray the king on horseback riding right, while the reverse has a lion right with cross. On copper coins, the king is seated on a throne, holding a cross and fleur-de-lys, and a cross appears on the reverse. It is noteworthy that only Gosdantin III issued coins inscribed, "struck in the city of Tarsus" (Darson in Armenian). So far we have not discovered coins of other rulers of Cilician Armenia inscribed with that name. Two takvorins of Gosdantin III are preserved in the author's collection. The unique feature of these takvorins is that their obverses are from the same die but the reverses denote different mints. On both coins the name of the city is abbreviated and **DAR** (Darson) is on the Tarsus coin, while **SS** is on the Sis coin.



1. Takvorin struck in Tarsus (2.22 g)

Obv.: King on horseback riding r. holding reins with l. hand, in r. circular mace extending over shoulder. At l. field mark . and letter **o** between king's mace and horse's tail. Clockwise legend, **+ԿՈՍԴԱՆՏԻՆԻՆ ԹԱԳ** (Gosdantin king).

Rev.: Lion walking and facing r. Behind, cross with one arm.

⁷ P. Z. Bedoukian, *Coinage of Cilician Armenia (CCA)* (New York, 1962), pp. 382–95, 2041–2128.

⁸ CCA, p. 96.

Clockwise legend, +ՇԻՆԵԼ Ի ՔԱՂԱՔ ՏԱՐ (struck in the city of Tarsus).

2. Takvorin struck in Sis (2.02 g)

Obv.: Same die as 1.

Rev.: Lion walking right as 1. Clockwise legend, +ՇԻՆԵԼ Ի ՔԱՂԱՔՆ ՍՍ (struck in the city of Sis).

Usually numismatists hypothesize that only coins of the same mint shared dies.⁹ The above two coins demonstrate that coins of Gosdantin III with the same obverse die were struck in different mints.

A close examination of the style of the lettering on both coins further clarifies this. The obverse and reverse style of lettering on the Tarsus coin are very close to each other. The style of lettering on the reverse of the Sis coin differs from the die linked obverse, signifying that it was cut by a different die engraver. Additionally, the dots of concentric circles on the obverse and reverse sides of the Tarsus coin are of the same size, suggesting the work of the same die engraver. On the Sis coin reverse, the dots of concentric circles are much larger than those of the obverse side, indicating a different die cutter. It can be concluded that the working dies of the Tarsus reverse and both obverses were the work of the same die engraver, most likely from the mint of Tarsus.

There are two possibilities for the preparation and shipment of the obverse dies. First, the working dies were manufactured from a mother die in Tarsus and then transported to mints in Sis or other cities. One must not forget that all Armenian kings were crowned in the St. Sofia Cathedral of Tarsus, had palaces there, and most of them were buried in St. Sofia and Holy Virgin Mary Cathedrals.¹⁰ Second, perhaps the die was used first in Tarsus, then transported to Sis to continue an interrupted coining process since the Tarsus coin is much sharper and better preserved—but this is less likely.

Tarsus was a major city of Cilicia and did have a mint in ancient times. There are extant satrapal coins which were struck in the

⁹ P. Z. Bedoukian, "Two Hoards of Levon II Trams," *NC* 145 (1985), pp. 124–35.

¹⁰ *Armenian Encyclopedia* 11 (Erevan 1985), p. 619 (in Armenian).

fourth century B.C. (Pharnabazus, 379-374 B.C.). Tarsus was incorporated in the empire of Tigranes the Great (95-56 B.C.), although there is no indication that he had an operational mint there. During Roman imperial times, it was the center of Cilicia and issued its own coinage with the "Mitropoleos" inscription. In addition to being the birthplace of St. Paul, Tarsus was a cultural center.

When Tarsus was a part of Cilician Armenia, it had schools of higher education and royal scriptoriums. The population of Tarsus was cosmopolitan and beside Armenians it included Assyrians, Greeks, Italians, and Jews. The official residence of the papal nuncio was in Tarsus.¹¹ The Armenians rebuilt the fortress and the city walls. Some medieval Armenian historians have called both Tarsus and Sis capitals of Cilician Armenia.¹² Bedoukian notes that when the Mamluks captured Tarsus in 1360, they made use of the mint by striking Muslim coins with the name of Tarsus.¹³ Was there an operational mint in Tarsus prior to the reign of Gosdantin III during the life span of Cilician Armenian kingdom? If so, the coins do not indicate it. Gold and silver coins of Levon I and Hetoum-Zabel bear no inscription about any mint. Only the copper coins and Hetoum I bilingual silver trams indicate that they were struck in Sis. Berj Garabetian is of the opinion that the mints in both Sis and Tarsus continuously struck silver, billon, and copper coins. He also concludes that the artistic trams of Levon I were struck in Tarsus.¹⁴ Paul Bedoukian also expresses the opinion that the rare silver coins of Levon I were struck in Tarsus prior to the establishment of a mint in Sis.¹⁵ Some historians mention that the Venetian merchants brought gold and silver bars to Cilician Armenia to strike coins.¹⁶ It would seem logical

¹¹ Fr. Gh. Alishan, *Sissouan* (Venice, 1885), p. 274 (in Armenian).

¹² *The Chronicle of Constable Smpad* (Venice, 1956), p. 245 (in Armenian).

¹³ P. Z. Bedoukian, "Medieval Armenian Coins," *Selected Numismatic Studies* (Los Angeles, 1981), p. 243.

¹⁴ B. Garabetian, "The Ancient Armenian Coin Collection of the St. Lazare Museum in the Venice Mekhitarist Congregation: Roupenian Coins," *Bazmavep* 110 (1952), pp. 155-68 (in Armenian.)

¹⁵ CCA p. 76.

¹⁶ G. G. Mikaelian, *The History of Cilician Armenian Government* (Erevan, 1952), p. 185 (in Russian).

that mints established in Tarsus and Ayas—close to the sea shore—would serve the best interest of Armenians as well as foreign merchants traveling to Cilician Armenia.¹⁷

If the mint in Tarsus were not an active mint when the kingdom was very prosperous economically because of the prevailing commerce and strong military, it would be very unlikely that a few decades before the downfall of the kingdom it would be activated. Perhaps for political expediency, the name of Tarsus was not inscribed on coins up to the regnal period of Gosdantin III. Levon V de Lusignan, the last monarch of the kingdom, did not inscribe the name of any mint on his billon and copper coins.¹⁸

CONCLUSION

Most of the coins of Cilician Armenia bear the inscription “struck in the city of Sis.” Coins of five princes and fourteen kings of Armenia are known to exist. Only the silver and copper coins of King Gosdantin III (1344–63) are inscribed either “struck in the city of Tarsus” or “struck in the city of Sis.” The two silver takvorins of Gosdantin III discussed above share the same obverse die but one was struck in Tarsus and the other in Sis. Based on the style of lettering of the coins, it would seem that the working dies were manufactured in Tarsus and transported to Sis.

A mint existed in Tarsus in ancient times as far back as the fourth century B.C. It is believed that some of the silver coins of King Levon I were struck in Tarsus before the establishment of a mint in the city of Sis. It is possible that the mint in Tarsus remained operational throughout the existence of the kingdom, but for political expediency its name was not inscribed on coins until the reign of Gosdantin III.

¹⁷ Fr. Au. Sekoulian, “Armenian Coins Struck in Ayas,” *ANJ* 4 (1978), pp. 75–80; Y. T. Nercessian, “Levon II Trams Struck in Ayas,” *ANJ* 4 (1978), pp. 81–90.

¹⁸ *CCA*, pp. 408–10, 2237–45.

SOME COINS OF MAS'UD I, QILIJARSLÂN II, AND THE MALIKS

(PLATE 23)

NEZİHİ AYKUT

Among the Anatolian Seljuqs, the first ruler for whom coins are known is Mas'ud I (1116-55).¹ It has been suggested that the Seljuq state which took shape in Anatolia was subject to the Great Seljuqs up to the time that sultan Sanjar (1118-57) fell prisoner (Muharrem 548/April 1153) in the battle he fought against his blood brothers the Oghuz near Balkh.² The Anatolian Seljuqs achieved complete inde-

¹ I thank the staff of the American Numismatic Society in New York for facilitating the research on Islamic coins which I carried out during my visit to the U.S.A. I owe special thanks to the Chief Curator of the coin collections Dr. William Metcalf and to Dr. Michael Bates, Curator of Islamic Coins, who spared no effort in welcoming and assisting me. In addition, I would like to give special thanks to the Librarian Mr. Francis D. Campbell who did his utmost to provide access to the relevant coin catalogues. I am particularly grateful to my old friend Dr. Rhoads Murphey who provided help by reading and offering suggestions for the improvement of this article. I would also like to thank Brian Johnson for his suggestions regarding the article.

² Ibn al-Athîr, *al-Kâmil fi al-Târikh* (Beirut, 1979), vol. 11, pp. 176-77; Ahmad bin Mahmûd, *Seljuq-nâma* (İstanbul, 1977); Erdoğan Mercil, vol. 2, pp. 78-79. On this supposedly epoch making battle, see, for example, Mehmet Altay Köymen, *Büyük Selçuklu İmparatorluğu Tarihi* (Ankara, 1955), vol. 2, pp. 411-12; and "Büyük Selçuklu İmparatorluğunda Oğuz İsyani," *Dil Ve Tarih-Coğrafya Fakültesi Dergisi* hereafter *DTCFD* (Ankara, 1947), vol. 5, 2, pp. 170-72; İbrahim Kafesoğlu, *Harezmşahlar Devleti Tarihi* (Ankara, 1956), p. 62.

pendence at this date during the reign of Mas'ūd I.³ Nevertheless, the claim that no coins were minted by the Anatolian Seljuqs prior to this time and that the first coins were struck by Mas'ūd I is probably incorrect.⁴ Among the Turkish Islamic states, the members of the dynasty to which the administration of certain regions was granted (i.e., the maliks)⁵ not only had administrative, financial, and legal freedom of action, but they also had the right to recite the khutba in the name of caliph and the sultan as well as in their own names, to play nawbat,⁶ to have inscriptions written in the sultan's name, and to strike coins.⁷ Consequently, when the first ruler of the Anatolian Seljuqs, Sulaimānshāh I, took over from Malikshāh (1072–92) the manshūr of malik ("royal tent,"⁸ i.e. governorship of Anatolia, one of

³ İsmail Hakkı Uzunçarşılı, *Osmanlı Devleti Teşilatına Medhal* (Ankara, 1970), p. 62.

⁴ Faruk Sümer reports in his "Türk Kültür Tarihine Umumi Bir Bakış," *DTCFD* (Ankara, 1962), vol. 20, 3–4, p. 222, and "Eski Türk Devletlerinde Para," *Sonçağ Dergisi*, hereafter *SD*, 12 (Ankara, 1962), p. 26, that the first coins struck among the Anatolian Seljuqs were issued by Mas'ūd I. İsmâ'ıl Ghâlib, *Taqvīm-i Maskūkāt-ı Seljūqiyya* (Kostantiniye, 1309), p. 5, explains the minting of no coins up to the time of Mas'ūd I by the fact that Sulaimānshāh I and his son Qilijarslān I were occupied with the development of the country. Faruk Sümer reports that the conquest of Anatolia was completed in the time of the first ruler, Sulaimānshāh I, and that the reign of Qilijarslān I was taken up with struggles against the Crusaders.

⁵ On the theory upon which the juridical authority of the maliks rested, see Halil İnalcık, "Osmanlılar'da Saltanat Verâseti Usûlü ve Türk Hakimiyet Telakkisiyle İlgisi," *Siyasal Bilgiler Fakültesi Dergisi* (hereafter, *SBFD*) (Ankara, 1959), vol. 14, 1, p. 71; İbrahim Kafesoğlu, "Anadolu Selçuklu Devleti Hangi Tarihte Kuruldu," *Tarih Enstitüsü Dergisi* (hereafter, *TED*), vols. 10–11 (1979–80), p. 21; and *Türk Milli Kültürü* (İstanbul, 1983), p. 350. Concerning the origin of the word malik from the word malka meaning king in the pre-Islamic period and its appearance in the coins of the Ephthalite rulers of the ancient Indian states, see W. Barthold-Fuad Köprülü, *İslam Medeniyeleri Tarihi* (Ankara, 1977), p. 83.

⁶ Nawbat was one of the signs indicating a ruler's sovereign power and involved a military band performing at his court.

⁷ İbrahim Kafesoğlu, "Anadolu Selçuklu Devleti" (above, n. 5), pp. 21–22; and *Türk Milli Kültürü* (above, n. 5), p. 350.

⁸ Mükrimin Halil Yınanç, *Türkiye Tarihi Selçuklular Devri, Anadolu'nun Fethi* (İstanbul, 1944), p. 130. İbrahim Kafesoğlu, "Anadolu Selçuklu Devleti" (above, n. 5), pp. 22–24, reports that Sulaimānshāh was appointed Malik of Anatolia, i.e., of the western end of the Great Seljuq Empire, by Sultan Malikshāh and was

the twelve provinces forming the Great Seljuq empire) and when his son Qilijarslān I was sent as malik to Anatolia by Barqyāruq (1092–1104),⁹ the son of the Great Seljuq sultan, following the death of Malikshāh (15–16 Shawwāl 485/19 November 1092),¹⁰ they surely must have exercised their right to mint coins in their names. Similarly, after Qilijarslān I was defeated in the battle he fought against Chāvlī (the Amīr of the Great Seljuq sultan Muhammad Tapār, 1105–17) and drowned in the Khābūr River (20 Zilkas‘da 500/13 July 1107)¹¹ his son Shāhinshāh, who had been taken prisoner by Amīr Chāvlī and sent to Muhammad Tapār,¹² was later released and sent to Anatolia on the condition that he recognize the sovereignty of the Great Seljuq sultan.¹³ Shāhinshāh left the sultan’s military encamp-

issued the manshūr. It is also reported that Malikshāh gave Qonīa, Aqsarīa, and all the lands of Rūm to the son of Qutalmish, Rukn al-Dīn Sulaimān, and appointed him malik over these regions. Furthermore, in Imād al-Dīn al-Kātib al-Isphahānī, *Zubdat al-Nusra wa Nukhbat Al-Usra*, trans. Kivameddin Burslan, *Irak ve Horasan Selçukluları Tarihi* (İstanbul, 1943), p. 69, mention is made of Sulaimānshāh as the Malik of Rūm.

⁹ İsmail Hakkı Uzunçarşılı (above, n. 3), p. 23. Osman Turan, *Selçuklular Zammanında Türkiye* (İstanbul, 1971), p. 96, reports that Qilijarslān I was sent to İznīq by Barqyāruq following Malikshāh’s death.

¹⁰ Ibn al-Azraq, *Muphassal Tārīkh-i Mayyāphariqīn*, British Museum, Or 5803, 159 b; Imād al-Dīn al-Isphahānī (above, n. 8), p. 69; Ibn al-Athīr (above, n. 2), vol. 10, p. 210; Sadr al-Dīn al-Isphahānī (above, n. 8), p. 69; Ibn al-Athīr (above, n. 2), vol. 10, p. 210; Sadr al-Dīn al-Husaynī (above, n. 8), p. 49; Ibn al-Adīm, *Zubdat al-haleb min tārīkh Khaleb* (Damascus, 1954): Sami Dahhān, vol. 2, p. 106. In Gregory Abū al-Faraj, *Mukhtasar al-Duwal* (Beirut, 1890): A. Salhānī, p. 337; Abī al-Fidā, *Tārīkh al Mukhtasar fi akhbār al bashar* (İstanbul, 1280), vol. 2, p. 213; Takīyy al-Dīn Ahmad b. Alī al-Maqrīzī, *Kitāb al-Sulūk li-ma‘rifat duwal al-mulūk* (Cairo: Muhammad Mustafa Ziyadat, 1934), vol. 1, 1, p. 33; Khāndmīr, *Habīb al-siyar fi akhbār afrād al-bashar* (Bombay: M. H. Kashānī, 1857), vol. 2, p. 90; and Ahmad bin Mahmūd (above, n. 2), p. 29, the death date is reported as 15–16 Shawwāl 485.

¹¹ Ibn al-Athīr (above, n. 2), vol. 10, pp. 429–30; Abī al-Fidā (above, n. 10), vol. 2, p. 233; Nuwayrī, *Nihāyat al-arab fi funūm al-adab*, Köprülü Library, MS, 1188, 16 b. The date of the battle according to Ibn al-Qalānisi, *Zayl-i Tārīkh-i Dimashq* (Beirut, 1908), p. 157, was 9 Shawwāl 500/3 June 1107.

¹² Ibn al-Qalānisi (above, n. 11), p. 158; Ibn al-Athīr (above, n. 2), vol. 10, p. 430; Gregory Abū al-Faraj (Bar Habraeus), *Abū al-Faraj Tārīkhī*, trans. Ömer Rıza Doğrul (Ankara, 1950), p. 347; Abī al-Fidā (above, n. 10), vol. 2, p. 213.

¹³ Abū al-Faraj (above, n. 12), p. 349.

ment at the beginning of Muharram 503/August 1109.¹⁴ He came to Anatolia and dismissed from office his younger brother Tughrıl Arslān who had been declared ruler by Amīr Bozmish at Malatīa upon his father's death. When Shāhinshāh became ruler in this city after imprisoning his other two brothers Mas'ūd and Arab,¹⁵ he must surely have had coins struck in his name. It would thus be correct to say that the first coins known of the Seljuqs of Turkey are the copper coins of Mas'ūd I and that if any were minted before his time, they have not survived to our day.

Among the Anatolian Seljuqs, Qilijarslān II (1155–92) was the first known to strike gold coins.¹⁶ He was also the first known to have struck silver coins beginning in the year 581/1185.¹⁷ Later, he also had copper coins struck bearing the image of a horseman which was a special feature of Seljuq coins.

According to the ancient Turkish concept of sovereignty, the state is regarded as the common property of the members of the dynasty,¹⁸ and the various parts of the country are given by the ruler to members of the dynasty to be administered directly by them.¹⁹ In accordance with this, Qilijarslān II appointed each of his 11 sons to rule over a different region of the country. These dynastic members, who were called maliks, possessed a governmental organization similar

¹⁴ Ibn al-Qalānisi (above, n. 11), p. 158; Anna Comnena, *The Alexiad*, trans. E. R. A. Sewter (Great Britain, 1969), p. 445, gives 1110 as the year that Qilijarslān I's eldest son Sāisān (Shāhinshāh) left Iran.

¹⁵ Suryāni Mihail, *Vakāyi'-nāma*, trans. Hrant D. Andreasyan, *Suryani Patrik Mihail'in Vekainamesi* (İstanbul, 1944), vol. 2, p. 54; Abū al-Faraj (above, n. 12), p. 349; Anna Comnena (above, n. 14), p. 445, reports that Sāisān (Shāhinshāh) established his hegemony at the capital Qonīa after defeating Amīr Asān (Tughrıl Arslān).

¹⁶ For further information on the dīnār struck by Qilijarslān II at Qonīa in 573, see İbrahim Artuk, "Abbasi ve Anadolu Selçukilerine ait iki eşsiz dinār," *İstanbul Arkeoloji Müzeleri Yıllığı* (hereafter, *İAMY*), vol. 18 (İstanbul, 1958), pp. 45 ff.

¹⁷ İsmā'ıl Ghālib (above, n. 4), pp. 4–5.

¹⁸ Osman Turan (above, n. 9), p. 216, and *Doğu Anadolu Türk Devletleri Tarihi* (City, date), p. 60; Halil İncalcık (above, n. 5), pp. 69–71; Nejat Kaymaz, "Anadolu Selçuklu Devletinin İnhitatında İdare Mekanizmasının Rolü," *Tarih Araştırmaları Dergisi* (hereafter, *TAD*) (Ankara, 1964), vol. 2, 2–3, p. 99.

¹⁹ Nejat Kaymaz (above, n. 18), p. 99.

to that in the empire's capital. They were obliged, however, to recognize the supreme power represented by the sultan at the center, as well as to wage war and pursue political contacts within the framework of the empire's main policy.²⁰ For example, despite the fact that they were in the position of semi-independent rulers in their own regions, they could not use the title sultan because they were subject to their father. Instead they had to be content with the rank of malik. In fact, even in the succession struggles that ensued following the death of Qilijarslān II, his sons remained bound to the law of the sultanate and did not attempt to use this title.²¹ This is confirmed both by the appearance of the malik in inscriptions²² and from existing coins.

Qilijarslān II made each of his sons a malik over specific areas. He gave Siwās and Nighda-Aqsarāy to the eldest of his sons, Qutb al-Dīn Malikshāh,²³ Toqāt and its environs to Rukn al-Dīn Sulaimānshāh, Malatīa to Mu'izz al-Dīn Qaisarshāh, Angūrīa (Anqara) and its environs to Muhy al-Dīn Mas'ūd, Albistān to Mughīth al-Dīn Tugh-

²⁰ İbrahim Kafesoğlu, *Anadolu Selçuklu Devleti* (above, n. 5), pp. 22–24, and *Türk Milli Kültürü* (above, n. 5), p. 350.

²¹ Osman Turan (above, n. 9), p. 218.

²² In Khalil Adham, *Qaisaria Shehri* (İstanbul, 1334), pp. 1–8, Sultānshāh is commemorated by this title in the inscription dated 589/1193 of the Qaisaria Khāja Hasan Madrasa; similarly, in İsmail Hakkı Uzunçarşılı, *Kitabeler* (İstanbul, 1927), vol. 1, pp. 64–65, Sulaimānshāh is mentioned as having the title “al-Malik al-Qāhir” in the fortress inscription at Niksār dated 594/1198.

²³ İmad al-Dīn al-Kātib al-Ispahāni, *al-Fath al-qussī fī al-fath al-quḍī* (Leyden, Carle de Landberg, 1888), vol. 1, p. 451; Ibn al-Athīr (above, n. 2), vol. 11, p. 89; Suryānī Mihail (above, n. 15), vol. 2, p. 289; Abū al-Fidā (above, n. 10), vol. 3, p. 88; Tāj al-Dīn Shāhinshāh b. Ayyūb, *Zayl-i Sīrat-i Salāh al-Dīn al-Ayyūbī* (Cairo, 1317), p. 306; Nuwayrī (above, n. 11), 17 a; Ibn al-Furāt, *al-Tārīkh al-vāzih al-maslūk* (Basra: Hasan Muhammad al-Shammā, 1969), vol. 4, 2, p. 93. In contrast Karīm al-Dīn Mahmūd Aqsarāyī, *Musāmamat al-akhbār* (Ankara: M. Nuri Gençosman and F. N. Uzluk, 1943), p. 127; Qādi Ahmad, *al-Walad al-Shaftk*, Fatih Library, 4518, 146 a; Ibn Bībī, *al-Avāmīr al-Alā'iyya fī al-Umūr al-Alā'iyya* (Ankara: Necati Lugal and Adnan Sadık Erzi, 1957), vol. 1, p. 38; Ibn Bībī, *Pharscha Mukhtasar Seljūqnāma*, trans. and ed. M. Nuri Gençosman and F. N. Uzluk, *Anadolu Selçuklu Devleti Tarihi* (Ankara 1941), p. 24; Yazıcı-zāda Ali, *Tavārīkh-i Āl-i Seljūq*, ed. M. Th. Houtsma, *Recueil de Textes Relatives à l'Histoire des Seldjoudes* (Leiden, 1902), p. 15, report that Rukn al-Dīn was Sulaimānshāh's eldest son.

rilshāh,²⁴ Amasīa to Nizām al-Dīn Arghūnshāh, Qonīa-Araghli and the southern borders known as the province of Ugāt to Sanjarshāh, Niksār and Koylhisār to Nāsir al-Dīn Barqyāruq,²⁵ Qaisariā to Nūr al-Dīn Sultānshāh,²⁶ and Nighda to Arslānshāh.²⁷ They were thereby appointed as maliks over these regions. Ulūborlı (Borgūlı) fell to the share of Ghiyāth al-Dīn Kaykhusraw,²⁸ his youngest son.²⁹ Qilijarslān II's appointment of each of his sons to a different part of the country took place in 582/1186.³⁰

Qilijarslān II's eldest son, Qutb al-Dīn Malikshāh, who was appointed malik of Sīwās (which Qilijarslān II had taken from the Dānishmand ruler Zunnūn in 570/1175)³¹ and of Aqsarāy³² (which he had established in 566/1170–71) played an active role in the succession disputes among the brothers. With the influence he had already gained, he subjugated his father and, after consolidating his rule over

²⁴ Ibn Athīr (above, n. 2), vol. 12, p. 88; Nuwayrī (above, n. 11), 16 b; Aynī, *Iqd al-Jumān*, Valiyy al-Dīn Efendi Library, MS, 2390, 81 a; Aqsarāyī (above, n. 23), p. 127; Qādī Ahmad (above, n. 23), 146 b–147 a; Ibn Bībī (above, n. 23), vol. 1, p. 30; Ibn Bībī, *Mukhtasar Seljūqnāma*, p. 24; Yazıcı Ali (above, n. 23), p. 11.

²⁵ Aqsarāyī (above, n. 23), p. 127; Ibn Bībī (above, n. 23), vol. 1, p. 30; Ibn Bībī, *Mukhtasar Seljūqnāma*, p. 24.; Yazıcı-zāda Ali (above, n. 23), pp. 11–12.

²⁶ Ibn al-Athīr (above, n. 2), vol. 12, p. 88; Nuwayrī (above, n. 11), 16 b; Aynī (above, n. 24), 81 a; Qādī Ahmad (above, n. 23), 147 a; Ibn Bībī (above, n. 23), vol. 1, p. 30; Ibn Bībī, *Mukhtasar Seljūqnāma*, p. 24; Yazıcı-zāda Ali (above, n. 23), p. 11.

²⁷ Qādī Ahmad (above, n. 23), 147 a; Ibn Bībī (above, n. 23), vol. 1, p. 30; Ibn Bībī, *Mukhtasar Seljūqnāma*, p. 24., Yazıcı-zāda Ali (above, n. 23), p. 11.

²⁸ Abī al-Fidā (above, n. 11), vol. 3, p. 89; Aqsarāyī (above, n. 23), p. 127; Qādī Ahmad (above, n. 23), 147 a; Ibn Bībī (above, n. 23), vol. 1, p. 17; Ibn Bībī, *Mukhtasar Seljūqnāma*, p. 21; Yazıcı-zāda Ali (above, n. 23), p. 3.

²⁹ Ibn al-Athīr (above, n. 2), vol. 12, p. 88; Abī al-Fidā (above, n. 10), vol. 3, p. 89; Ibn Bībī (above, n. 23), vol. 1, p. 17.

³⁰ Osman Turan (above, n. 9), p. 218.

³¹ Süryānī Mihail (above, n. 15), vol. 2, p. 233; Abū al-Faraj (above, n. 12), p. 418; Khāndmīr (above, n. 10), vol. 2, p. 90.

³² Hamd Allāh Mustawphi-i Qazwīnī, *Nuzhat al-Qulūb* (Tehran: Muhammed Dabir Siyaki, 1958), p. 111; and *Tārīkh-i Ghuzide* (Tehran, 1339), p. 482. In an *Anonymous Seljūqnāma*, trans. and ed. Feridun Nafiz Uzluk, *Anadolu Selçukluları Devletleri Tarihi* (Ankara, 1952), p. 25, the year of the founding of the city is cited as 550/1155. Aqsarāyī (above, n. 23), p. 127; Ahmad bin Mahmūd (above, n. 2), vol. 2, p. 148; and Qādī Ahmad (above, n. 23), 146 b, report that Aqsarāy was founded by Qilijarslān II but do not give a date.

Qonġa,³³ declared himself heir to the throne (Ramadā 585/October-November 1189).³⁴ Later, he took action to eliminate his brothers. In order to capture Qaisariā from Sultānshāh, Malikshāh enlisted the services of his father and surrounded the fortress. But when his father took advantage of an opportunity during the siege to seek refuge with Sultānshāh in order to escape Malikshāh's oppression, Malikshāh abandoned the siege and turned back. Establishing himself at Aqsarāy and Qonġa, he declared his independence by having the khutba recited in his name.³⁵ Meanwhile, Qilijarslān II, attempting to seize the throne of his son Sultānshāh, fled under the latter's pressure. After visiting his other sons, he finally went to his youngest son, Kaykhusraw, Malik of Borgūh (Ulūborh). Together they succeeded in taking Qonġa from Malikshāh.³⁶ Qilijarslān II made Kaykhusraw his heir, and together they marched on Malikshāh and surrounded Aqsarāy. Qilijarslān fell ill during the siege,³⁷ however, and died on 15 Sha'bān 588/26 August 1192.³⁸

³³ Imad al-Dīn al-Isphahānī, *al-Fath al-qussī* (above, n. 23), vol. 1, p. 425; Ibn al-Athīr (above, n. 2), vol. 12, p. 87; Abū al-Faraj, *Mukhtasar al-Duwal* (above, n. 10), p. 388; Abū Shāma, *al-Rawzatayn fī akhbār al-dawlatayn* (Cairo, 1288), vol. 2, p. 209; Abī al-Fidā (above, n. 10), vol. 3, p. 88; Tāj al-Dīn Shāhinshāh (above, n. 23), p. 306; Nuwayrī (above, n. 11), 17 a; Ibn al-Furāt (above, n. 23), vol. 4, 2, pp. 93–94; Aynī (above, n. 24), 42 b.

³⁴ *Anonymous Seljūqnāma* (above, n. 32), p. 26. Ibn al-Furāt (above, n. 23), vol. 4, 2, p. 94, reports that Malikshāh was the crown prince but that he retained his father's name in the khutba and on coins.

³⁵ Imad al-Dīn al-Isphahānī, *al-Fath al-qussī* (above, n. 23), vol. 1, p. 452; Ibn al-Athīr (above, n. 2), vol. 12, p. 88; Abū al-Faraj, *Mukhtasar al-Duwal* (above, n. 10), p. 337; Abū Shāma (above, n. 33), vol. 2, p. 209; Abī al-Fidā (above, n. 10), vol. 3, p. 89; Tāj al-Dīn Shāhinshāh (above, n. 23), p. 306; Nuwayrī (above, n. 11), 17 a; Ibn al-Furāt (above, n. 23), vol. 4, 2, p. 94; Aynī (above, n. 24), 80 b.

³⁶ Imad al-Dīn al-Isphahānī, *al-Fath al-qussī* (above, n. 23), vol. 1, p. 452; Ibn al-Athīr (above, n. 2), vol. 12, p. 88; Abū al-Faraj, *Mukhtasar al-Duwal* (above, n. 10), p. 337; Abū Shāma (above, n. 33), vol. 2, p. 89; Abī al-Fidā (above, n. 10), vol. 3, p. 89; Tāj al-Dīn Shāhinshāh (above, n. 23), p. 306; Nuwayrī (above, n. 11), 17 a; Ibn al-Furāt (above, n. 23), vol. 4, 2, pp. 94–95.

³⁷ Imad al-Dīn al-Isphahānī, *al-Fath al-qussī* (above, n. 23), vol. 1, p. 452; Ibn al-Athīr (above, n. 2), vol. 12, p. 88; Suryānī Mihail (above, n. 15), vol. 2, p. 289; Abī al-Fidā (above, n. 10), vol. 3, p. 89; Tāj al-Dīn Shāhinshāh (above, n. 23), p. 306; Nuwayrī (above, n. 11), 17 a; Ibn al-Furāt (above, n. 23), vol. 4, 2, p. 95.

³⁸ Imad al-Dīn al-Isphahānī, *al-Fath al-qussī* (above, n. 23), vol. 1, p. 451; Ibn al-

During the reign of Kaykhusraw I, who became the sultan of the Anatolian Seljuqs after his father's death, Malikshāh maintained his rule over Sīwās and Aqsarāy. He also succeeded in seizing Qaisariā. One day while traveling from Aqsarāy to Sīwās he made a detour to Qaisariā. From his camp outside the city, Malikshāh sent greetings to his brother Sultānshāh. When Sultānshāh came out to meet him, Malikshāh had him killed.³⁹ Tossing his brother's head in front of his men, he attempted to take the fortress. Although the people of Qaisariā at first opposed him, they finally surrendered the city under certain conditions. Before long, however, Malikshāh took ill and died.⁴⁰ The dirhams struck in Malikshāh's name at Qaisariā in the same year confirm that he eliminated his brother and conquered the city in 593/1196–97.⁴¹ In addition to the silver striking, there are also undated copper coins.

Toqāt and its environs fell to the share of Rukn al-Dīn Sulaimānshāh, one of Qilijarslān II's 11 sons who had been appointed as maliks to various parts of the country. From Toqāt, Sulaimānshāh extended the borders of his principality against Byzantium by conquering the region up to the Black Sea coast. During the process of expansion he gained control of Sāmsūn as well.⁴² Entering into the succession struggle, Sulaimānshāh maintained his rule over all these areas until he became the Anatolian Seljuq sultan on 7 Zilka'da 593/21 September 1197⁴³ and had copper coins struck in his name. These coins bear no minting date.

Athīr (above, n. 2), vol. 12, p. 87; Abū al-Faraj, *Abū al-Faraj Tārīkhi* (above, n. 12), p. 462; and *Mukhtasar al-Duwal* (above, n. 10), p. 337; Abū Shāma (above, n. 33), vol. 2, p. 89; Abī al-Fidā (above, n. 10), vol. 3, p. 88; Tāj al-Dīn Shāhinshāh (above, n. 23), pp. 305–6; Nuwayrī (above, n. 11), 17 a; Aynī (above, n. 24), 80 a–b.

³⁹ Ibn al-Athīr (above, n. 2), vol. 12, p. 89; Nuwayrī (above, n. 11), 17 a.

⁴⁰ Ibn al-Athīr (above, n. 2), vol. 12, pp. 89–90; Nuwayrī (above, n. 11), 17 a.

⁴¹ *İstanbul'un Fetminden Önce Yazılmış Tarihi Takvimler* (Ankara: Osman Turan, 1954), p. 77; İbrahim Artuk, *VI. Türk Tarih Kongresi Zabıtları* (Ankara, 1967), p. 243.

⁴² Osman Turan, *Türkiye Selçukluları Hakkında Resmi Vesikalar* (Ankara, 1958), p. 122; *Selçuklular Zamanında Türkiye* (above, n. 9), pp. 219, 242.

⁴³ *Anonymous Seljūqnāma* (above, n. 32), p. 27.

Before his death (550 H./1155 M.), Mas'ūd I had appointed his youngest son Shāhinshāh malik of Chāngırı, Qastamonī, and Angūria (Anqara).⁴⁴ His elder brother Qilijarslān II captured these provinces after becoming sultan of the Anatolian Seljuqs.⁴⁵ When he appointed each of his 11 sons maliks of different parts of his domains in 1186, Angūria and its environs fell to the portion of Muhy al-Dīn Mas'ūd. Mas'ūd then launched attacks against the Byzantines and captured Saphrānbolī. He also gained control of the regions of Chāngırı, Qastamonī, Bolı, and Askishehır with Anqara at the center.⁴⁶ But like his other brothers, Rukn al-Dīn Sulaimānshāh II, the sultan of the Anatolian Seljuqs, took action to eliminate his brother Mas'ūd. He marched on Anqara and besieged his brother in the city's fortress. At the end of a siege which lasted three years,⁴⁷ Mas'ūd agreed to surrender the city because of shortages of food and munitions. While withdrawing to a fortress which had been granted to him in the surrender agreement, he was murdered together with his two sons by a detachment of troops that had been sent in pursuit of them (Zilka'da 600/July 1204).⁴⁸ Dated silver and copper coins exist which were apparently minted in Anqara during Mas'ūd's reign over the city and its environs.

Mughīth al-Dīn Tugrılshāh (whom Qilijarslān II appointed malik of Albistān which had been captured from the Dānishmand Amīr Ayn al-Dawla during the reign of his father Mas'ūd I in 539/1144)⁴⁹ succeeded in maintaining his rule over this region both during his father's lifetime and during the conflict between his brothers for the Anatolian Seljuq throne. He shifted his support among his elder

⁴⁴ Osman Turan, *Selçuklular Zamanında Türkiye* (above, n. 9), p. 192; *EI.*, vol. 1, p. 442a, s.v. "Ankara" (J. Ruska).

⁴⁵ Ibn al-Athīr (above, n. 2), vol. 11, p. 317; Suryānī Mihail (above, n. 15), p. 206; Aynī (above, n. 24), Valiyy al-Dīn Efendi Library, MS, 2309, 377.

⁴⁶ Osman Turan, *Selçuklular Zamanında Türkiye* (above, n. 9), p. 261.

⁴⁷ Ibn al-Athīr (above, n. 2), vol. 12, p. 90; Nuwayrī (above, n. 11), 17 a.

⁴⁸ Ibn al-Athīr (above, n. 2), vol. 12, p. 90; Abū al-Faraj, *Abū al-Faraj Tārīkhi* (above, n. 12), pp. 485–6; Ibn Wāsil, *Mufarrij al-kurūb*, Molla Chelebi Library, 119, 45 a; Abū al-Fidā (above, n. 10), vol. 3, p. 111; Nuwayrī (above, n. 11), 17 a.

⁴⁹ Suryānī Mihail (above, n. 15), vol. 2, p. 123.

brothers who aspired to be sultan.⁵⁰ He also secured support against his brothers' aggression by winning the friendship of the Armenian King Leon II (1187–1219),⁵¹ and he ruled at Albistān for a long time.

When Sulaimānshāh succeeded to the Anatolian Seljuq throne, he attempted to establish Seljuq unity in Anatolia. First he captured Amasīa from Arghūnshāh, then Biksār from Barqtāruq.⁵² Tughrlīshāh, who was Malik of Albistān, immediately declared his submission to his elder brother and recognized him as sovereign, thereby preserving his own autonomy.⁵³ Before setting out on his Georgian campaign, Sulaimānshāh II put an end to the dynasty of the Saltūqids by capturing the city of Arzurūm from Nāsir al-Dīn Muhammad in 598/1202⁵⁴ and appointed his brother Mughīth al-Dīn Tughrlīshāh as malik of Arzurūm.⁵⁵ A continuous Seljuq dynasty was thus established during the reign of Tughrlīshāh and his son.

Tughrlīshāh reigned as an autonomous malik in Arzurūm for 23 years from 1202 to 1225. His independence is clearly confirmed by the coins he had struck during the reign of his nephew Kaykāwus I. The absence of Kaykāwus's name on the silver coins he had struck at Arzurūm in 608 (1211/2), 610 (1213/4),⁵⁶ 613 (1216/7), and 616 (1219/

⁵⁰ *EI*, vol. 4, p. 225a–b, sv. "Elbistan" (M. H. Yinanç).

⁵¹ Süryāni Mihail (above, n. 15), vol. 2, p. 291.

⁵² Ibn al-Athīr (above, n. 2), vol. 12, p. 90; Nuwayrī (above, n. 11), 17 a.

⁵³ Ibn Bībī, *al-Avāmīr al-Alā'iyya* (above, n. 23), vol. 1, p. 102; Ibn Bībī, *Pharscha Mukhtasar Seljūqnāma* (above, n. 23), p. 37; Yaziji-zāda Ali (above, n. 23), p. 57. Each of these sources reports that Sulaimānshāh II invited all his brothers to join him when he set out on his Georgian campaign. Tughrlīshāh was the first to offer his services.

⁵⁴ Ibn al-Athīr (above, n. 2), vol. 12, p. 169; Abū al-Faraj, *Abū al-Faraj Tārīkhī* (above, n. 12), p. 474; and *Mukhtasar al-Duwal* (above, n. 10), p. 393; Abī al-Fidā (above, n. 10), vol. 3, p. 106; Aqsarāyī (above, n. 23), p. 218; Ibn Bībī (above, n. 23), pp. 105–6; Ibn Bībī, *Pharscha Mukhtasar Seljūqnāma*, pp. 37–38; Yaziji-zāda Ali (above, n. 23), p. 59; Munajjimhashi Ahmad Dede, *Sahā'iph al-akhbār*, trans. Hans Fehmi Turgal, *Anadolu Selçukleri* (İstanbul, 1939), p. 12.

⁵⁵ Ahmad bin Mahmūd (above, n. 2), vol. 2, p. 150; Aqsarāyī (above, n. 23), p. 218; Qādī Ahmad (above, n. 23), 147 b; Ibn Bībī, *al-Avāmīr al-Alā'iyya* (above, n. 23), vol. 1, p. 106; Ibn Bībī, *Pharscha Mukhtasar Seljūqnāma*, p. 38; Yaziji-zāda Ali (above, n. 23), p. 59.

⁵⁶ For coins of this date, see Qaisariya Museum, inv. nos. 84/548, 550, 551, and 552.

20) indicates that he was completely independent and that his submission to his elder brother Sulaimānshāh II endured as long as the latter was alive.⁵⁷ In addition to silver coins, undated copper coins also exist which Tugrīlshāh had struck during his long reign as malik.

At the death of Mughīth al-Dīn Tugrīlshāh in 622/1225,⁵⁸ his son Rukn al-Dīn Jihānshāh took his place and ruled at Arzurūm until 627/1230. Jihānshāh's cousin Alā al-Dīn Kayqubād I (1220–37) put an end to the Mangūjiqs of Arzinjān by capturing Arzinjān and Kamāh from Alā al-Dīn Dāvudshāh (1225–28) in 625.⁵⁹ In order to preserve his control over Arzurūm, Jihānshāh first recognized the Ayyubid malik Ashraph Mūsā as sovereign.⁶⁰ Subsequently, during the siege of Akhlāt in Shawwāl 626/August-September 1229⁶¹ by the ruler of the state of the Khwarezm, Jalāl al-Dīn Mangūbirtī, Jihānshāh abandoned the Ayyubids and allied himself instead to the sultan of Khwarezm. He also had the khutba recited in his name.⁶² Moreover, he joined the sultan of Khwarezm during the battle of Yassi-Chimen near Arzinjān-Aqshehīr⁶³ on 28 Ramadān 627/10

⁵⁷ Osman Turan, *Doğu Anadolu Türk Devletleri Tarihi* (above, n. 18), pp. 25–26.

⁵⁸ Ibn al-Athīr (above, n. 2), vol. 12, p. 429; Nuwayrī (above, n. 11), 18 a.

⁵⁹ Ibn al-Athīr (above, n. 2), vol. 12, pp. 478–79; Abū al-Faraj, *Abū al-Faraj Tārīkhī* (above, n. 12), p. 525; Nuwayrī (above, n. 11), 18 a; Zahabī, *Tārīkh al-İslām*, Aya-Sophia Library, MS., 3012, 235 b; Aynī (above, n. 24), Valiyy al-Dīn Efendi Library, MS., 2391, p. 79; Ibn Bībī (above, n. 23) (Ankara, 1956) (*Türk Tarih Kurumu* [T. T. K.] Facsimile), pp. 356–58; Ibn Bībī, *Pharscha Mukhtasar Seljūqnāma* (above, n. 23), pp. 137–38; Yazıcı-zāda Ali (above, n. 23), p. 388–89.

⁶⁰ Aynī (above, n. 24), p. 79; Nasawī, *Sirat al-Sultān Jalāl al-Dīn Mangūbirtī*, ed. O. Houdas (Paris, 1891), p. 184.

⁶¹ Ibn al-Athīr (above, n. 2), vol. 12, p. 487; Maqrīzī (above, n. 10), vol. 1, 1, p. 236.

⁶² Nasawī (above, n. 60), p. 184.

⁶³ Ibn al-Athīr (above, n. 2), vol. 12, p. 490; Ibn al-Adīm (above, n. 10) (Dimashq, 1968), vol. 3, p. 209; Nasawī (above, n. 60), p. 206; Abū al-Faraj, *Abū al-Faraj Tārīkhī* (above, n. 12), p. 525, and *Mukhtasar al-Duwal* (above, n. 10), p. 429; Ibn Wāsil (above, n. 48), 159 b; Nuwayrī (above, n. 11), 18 a; Aynī (above, n. 24), p. 79; Aqsarāyī (above, n. 23), pp. 129–30; Ahmad Aflākī, *Menāqib al-ʿĀrifīn*, trans. Tahsin Yazıcı, *Āriflerin Menkıbeleri* (İstanbul, 1973), vol. 1, p. 119; Ibn Bībī, *al-Avāmīr al-Alāʾiyya* (above, n. 23), p. 392; Ibn Bībī, *Pharscha Mukhtasar Seljūqnāma* (above, n. 23), p. 153.

August 1230.⁶⁴ Jihānshāh was taken prisoner during this battle which Jalāl al-Dīn Mangūbirtī lost.⁶⁵

Following their victory, Kayqubād I and Malik Ashraph Mūsā marched on Arzurūm.⁶⁶ Although Jihānshāh's brother and the beys of Arzurūm tried to defend the city, the beys quickly realized that resistance was hopeless. After exacting a promise that Jihānshāh and his brother would not be killed or harmed and that they would be allowed to keep their possessions, they surrendered the city.⁶⁷ Sultan Alā al-Dīn Kayqubād I pardoned his cousin Jihānshāh, who was also his son-in-law, and gave Aqsarāy and Ayūbhisār to him and his brother as an iqtā'.⁶⁸ Arzurūm and its environs he added to his own domains. Both dated and undated copper coins exist which were struck in the city by Jihānshāh who reigned until 1230 as the last member of the dynasty that had been established at Arzurūm.

⁶⁴ Ibn al-Amīd, *Tārīkh-i Mukhtasar al-Tabarī*, Lāleli Library, MS, 2002, 229 b; Maqrīzī (above, n. 10), vol. 1, 1, p. 240. The date of the battle was 28 Ramadān 627 in Ibn al-Athīr (above, n. 2), vol. 12, pp. 489–90; Sibṭ Ibn al-Jawzī, *Mir'at al-zamān fī tārīkh al-ayyān* (Haydarabad, 1952), vol. 2, p. 661. Nuwayrī (above, n. 11), 18 a; Aynī (above, n. 24), p. 102; and Ibn Bībī, *Pharscha Mukhtasar Seljūqnāma* (above, n. 23), p. 157, and "29 Ramadān 627" in Ibn al-Adīm (above, n. 10), vol. 3, p. 209; Ibn Wāsil (above, n. 48), 160 a; and Abī al-Fidā (above, n. 10), vol. 3, p. 153. Abū al-Faraj, *Abū al-Faraj Tārīkhī* (above, n. 12), p. 528, gives the date as August 1230.

⁶⁵ Ibn al-Athīr (above, n. 2), vol. 12, pp. 490–91; Nasawī (above, n. 60), p. 207; Sibṭ Ibn al-Jawzī (above, n. 64), vol. 2, p. 662; Abū al-Faraj, *Abū al-Faraj Tārīkhī* (above, n. 12), p. 528, *Mukhtasar al-Duwal* (above, n. 10), p. 429; Ibn Wāsil (above, n. 48), 160 a; Aynī (above, n. 24), p. 79; Ibn Bībī, *al-Avāmīr al-Alā'iyya* (above, n. 23), pp. 392–406, *Pharschā Mukhtasar Seljūqnāma*, p. 159.

⁶⁶ Ibn al-Athīr (above, n. 2), vol. 12, p. 491; Sibṭ Ibn al-Jawzī (above, n. 64), vol. 2, p. 662; Abū al-Faraj, *Abū al-Faraj Tārīkhī* (above, n. 12), p. 528; Ibn Bībī, *al-Avāmīr al-Alā'iyya* (above, n. 23), p. 406, *Pharscha Mukhtasar Seljūqnāma* (above, n. 23), p. 159.

⁶⁷ Ibn al-Athīr (above, n. 2), vol. 12, p. 491; Abū al-Faraj, *Abū al-Faraj Tārīkhī*, p. 528; Ibn Bībī, *al-Avāmīr al-Alā'iyya* (above, n. 23), pp. 407–10, *Pharscha Mukhtasar Seljūqnāma* (above, n. 23), pp. 160–61.

⁶⁸ Ibn Bībī, *Pharscha Mukhtasar Seljūqnāma* (above, n. 23), p. 161.

CATALOGUE

Mas'ūd I (1116–55)

1: ANS 1956.110. 1.

Obv.: Alexios Comnenos I, globe in r., labarum in l.

Rev.: 1.	السَلْطَان	al-Sultān
2.	المُعْظَم	al-Mu'azzam
3.	مسعود بن	Mas'ūd b.
4.	قلج ارسلان	Qilijarslān

Æ n. m., n. d. Artuk 1, 1059; *Marseille*, 213–14; *Bibliothèque*, 1599; Broome, 149.⁶⁹

Qilijarslan II (1155–92)

2: ANS 1949, 163.123 and .124

Obv.: Horseman, spear in r., horse's head r.

Rev.: 1.	السَلْطَان	al-Sultān
2.	قلج لمظم	Qilij, al-Mu'azzam
3.	ارسلان	Arslān
4.	بن مسعود	b. Mas'ūd

Æ n. m., n. d. Artuk 1, 1062: Mitchener, 954; al Ush, 175; *Marseille*, 215–17; *Bibliothèque*, 1604.

⁶⁹ The following volumes are cited in the catalogue; I. and C. Artuk, *Istanbul Arkeoloji Muzeleri Teshirdeki Islami Sikkeler Katalogu*, vol. 1. (Istanbul, 1970) and vol. 2 (Istanbul, 1974); Michael Broome, *A Handbook of Islamic Coins* (Seaby, 1985); G. Hennequin, *Catalogue des monnaies orientales, archives de la ville de Marseille, cabinet des medailles* (1983), hereafter *Marseille*; G. Hennequin, *Catalogue des monnaies musulmanes de la Bibliothèque Nationale: Asie pre-Mongole, Les Salguqs et leurs successeurs* (Paris, 1985), hereafter, *Bibliothèque*; G. Hennequin and Abu-l-Faraj al-'Ush, *Les Monnaies de Balis* (Damascus, 1978), hereafter, al-'Ush; Michael Mitchener, *The World of Islam: Oriental Coins and Their Values* (London, 1977); and N. D. Nicol, R. el-Nabarawy, J. L. Bacharach, *Catalog of the Islamic Coins, Glass Weights, Dies and Medals in the Egyptian National Library, Cairo* (1982).

Qutb al-Dīn Malikshāh (1186–92)

Malik of Sīwās and Aqsarāy

3: ANS 1917.33.12

Obv.: Horseman holding spear in r., Victory figure on horse's back.

Rev.: 1. **أبو الفتح** Abū al-Fath
 2. **ملك شاه بن** Malikshāh b.
 3. **قلج ارسلان** Qilijarslan

Æ n. m., n. d. *Marseille*, 219–20; *Bibliothèque*, 1623–28.

Rukn al-Dīn Sulaimānshāh (1186–97)

Malik of Toqāt

4: ANS 1917.216.795

Obv.: Horseman, halo around head, holding three-pronged halberd in r., horse's head r.

Rev.: 1. **الملك القاهر** al-Malik al-Qāhir
 2. **سليمان شاه** Sulaimānshāh
 3. **بن قلج ارسلان** b. Qilijarslān

Æ n.m., n.d. Artuk 1, 352; 1066; Nicol., 3379; *Bibliothèque*, 1693–98a; Broome, 170–71.

Muhi al-Dīn Mas'ūd (1187–1204)

Malik of Anqara

5: ANS 1977.274.97

Obv., in square: 1. **العبد الضعيف** al-'Abd al-Ḍa'īf
 2. **المحتاج الى** al-Muhtāj ilā
 3. **رحمة الله** rahmat Allāh

In margin: 1.	ضرب	Duriba
2.	هذا	hāzā
3.	الدر	al-dir
4.	هم	ham

Rev., in square: 1.	مسعود بن	Mas'ūd b.
2.	قلج ارسلان	Qilijarslān
3.	بن مسعود	b. Mas'ūd

In margins: 1.	سنة	sanat
2.	تسعين	tis'in
3.	وخمس	wa khams
4.	مائة	mi'at

Æ n. m., 590. *Marseille*, 221; *Bibliothèque*, 1630.

Mughīth al-Dīn Tughrīlshāh (1202–25)

Malik of Arzurūm

6: ANS 1980.141.12

Obv., in center: 1.	لا اله الا الله	Lā ilāha illā Allāh
2.	وحده لا شريك له	wahdah lā-sharik lah
3.	الناصر لدين الله	al-Nāsir li-Dīn Allāh
4.	امير المؤمنين	Amīr al-Mu'minīn

In margin: 1.	الامام	al-Īmām
2.	ضرب هذا	duriba hāz[ā]
3.	الدينار	al-dīnār
4.	بارزروم	bi-Arzurūm

- Rev., in center: 1. محمد رسول الله Muhammad Rasūl Allāh
 2. مغيث الدنيا والدين Mughīth al-Dunyā wa al-Dīn
 3. ابو الفتح طغرل Abū al-Fath Tughrl
 4. بن قلع أرسلان b. Qilijarslān

- In margin: 1. سنة sanat
 2. ستة و عشر sittat wa ashar
 3. وستمائة wa sitt-mī'at

Æ Arzurūm, 616.

7: ANS 1959.165.177

Obv.: Horseman, halo around head, three-pronged halberd in r., horse's head r.

- Rev., in center: 1. مغيث الدنيا Mughīth al-Dunyā
 2. والدين ابو الفتح wa al-Dīn Abū al-Fath
 3. طغرل بن قلع Tughrl b. Qilij
 4. أرسلان Arslān

Æ n. m., n. d. Artuk 1, 1072; *Marseille*, 218; *Bibliothèque*, 1615–19.

Rukn al-Dīn Jihānshāh (1225–30)

Malik of Arzurūm

8: ANS 1917.216.764

Obv., in square: Ruler, halo around head, seated on throne.

L. margin: سنة ستة وعشرين sanat sittat ishrīn

Rev., in center: 1. ركن الدنيا والدين Rukn al-Dunyā wa al-Dīn

2. **أبو الفتح جهانشاه** Abū al-Fath Jihānshāh

3. **بن طغرل** b. Tugrīl

Æ n. m., 626. Mitchener, 961 (n. d., partial reverse reading);
Bibliothèque, 1630–22.

In the period of the early Anatolian Seljuqs, coins belonging to the Byzantine Empire and other Islamic states circulated in Anatolia.⁷⁰ Like the first Danishmandid, Artuqid, and Zangid coins, early Anatolian Seljuq coinage was copied from Byzantine models. This phenomenon was principally the result of economic necessity.⁷¹ One difference between the Seljuqs and the contemporary Turkoman Beyliks, however, was that except for the inscriptions, the other features of their gold and silver coins were directly copied from Abbasid models.⁷² It is clear that the reason for this imitation of Abbasid forms was the strong spiritual bond that existed between Baghdād and Qonīa.

The earliest Seljuq coins known to us today belong to the reign of Mas'ūd I. These coins are exclusively copper.⁷³ No silver coins have survived. For those coins which imitated Byzantine models, the only type found bears an image resembling the Byzantine Emperor, Alexios Comnenos I (1081–1118), holding a globe with a cross on the top in

⁷⁰ Osman Turan, *Türkiye Selçukluları Hakkında Resmi Vesikalar* (Ankara, 1958), p. 131; Claude Cahen, *Pre-Ottoman Turkey*, trans. Yıldız Moran, *Osmanlılardan önce Anadolu'da Türkler* (Istanbul, 1979), p. 173, indicates that the early Seljuqs made use of already circulating Byzantine coins.

⁷¹ Fuad Köprülü, "Bizans Müesseselerinin Osmanlı Müesseselerine Tesiri Hakkında Bazı Mülâhazalar," *Türk Hukuk ve İktisat Tarihi Mecmuası* (Istanbul, 1931), vol. 1, p. 296.

⁷² İsmâ'il Ghâlib (above, n. 4), p. 6; Hasan Farîd, *Naqd wa l'tibâr-ı Mâlî* (Istanbul, 1330), vol. 1, p. 160.

⁷³ Those coins were usually not pure copper but a copper alloy containing a mixture of copper, pewter, and zinc. Uzunçarşılı indicates that the origin of the term "mangır" is the Mongolian word for money, "mungun." Whereas Turkish retains a close equivalent to the Mongol term and employs the forms "mangur," "mankur," and "mankır" the Persians refer to this copper coinage as "pishîz" and the Arabs call it "fals," E.I., vol. 7, p. 282 b, s.v. "Mangir."

one hand and in the other hand a bust resembling a labarum.⁷⁴ Four of the coins (all copper issues) which appear in recently published catalogues are attributable to the reign of Mas'ūd I (1116–55). The examples in Istanbul, Marseilles, Paris, and the Broome collection⁷⁵ are all undated and contain the bust of the Byzantine emperor Alexios Comnenos I on the obverse with the sultan's title al-Sultān al-Mu'azzam on the reverse.

Qilijarslan II struck copper coins which were different from those of his father Mas'ūd I. Only one type has survived, and it is smaller than the type minted by his father. The place and date of minting are not mentioned on the copper coins. Like earlier Gurid coins, an image of a horseman holding a spear appears on the obverse.⁷⁶ Various museum collections contain silver, gold, and copper coins from the reign of Qilijarslān II. A gold coin minted in Qonīa in 573 is in the Istanbul Archaeological Museum collection.⁷⁷ Single silver dirhams are also found in Istanbul (minted in Qonīa in 588)⁷⁸ and in the catalogues of Mitchener⁷⁹ and Album⁸⁰ (minted in Qonīa in 582). Three further examples are located in the Bibliothèque Nationale collection of Paris (two dirhams minted in Qonīa in 582 and a quarter dirham of unknown date and place of minting).⁸¹ On the Istanbul specimen and the coin from the Album catalogue, the name Nāsar li-Dīn Allāh and title Amīr al-Mu'minīn of the Abbasid Caliph appear on the obverse of

⁷⁴ The globe is a symbol of sovereignty and the cross represents Christ. See S. W. Stevenson, *Dictionary of Roman Coins* (London, 1964), p. 420; F. Von Schrötter, *Wörterbuch der Munzkunde* (Berlin-Leipzig, 1930), p. 226. The labarum is another common way of symbolizing Christ where the cross appears within its own frame as an emblem. See S. W. Stevenson, p. 500; F. Von Schrötter, p. 340.

⁷⁵ Artuk, vol. 1, 1059; *Marseille*, 213; *Bibliothèque*, 1599; Broome, 169.

⁷⁶ The Gurid dynasty ruled part of present-day Afghanistan. See Īsmā'īl Ghālib (above, n. 4), p. 8; Hasan Farid (above, n. 72), p. 161.

⁷⁷ Artuk, vol. 1, 1060.

⁷⁸ Artuk vol. 1, 1061.

⁷⁹ Mitchener, 953. Mitchener's catalogue lists the date and mint of this dirham as Qonīa, 591. This is clearly impossible if it is to be attributed to Qilijarslān II who died in 588. We therefore assume that the date of minting given in the catalogue should be 581 instead of 591.

⁸⁰ Album, p. 124, 1.

⁸¹ *Bibliothèque*, 1602 and 1603.

the coins, and the Sultan's title al-Sultān al-Mu'azzam is found on the reverse. Examples of Qilijarslān II's copper issues are found in Istanbul, Marseille, and Balis.⁸² These copper coins are all without date or place of minting. They display the image of a horseman on the obverse and the title of the sultan, al-Mu'azzam, on the reverse.

Various museum collections contain coins belonging to five of Qilijarslan II's eleven sons—Malikshāh, Sulaimānshāh, Qaisarshāh, Mas'ūd, and Tughrilshāh—all of whom were appointed as governors (maliks) in various Seljuqid provinces. Coins also exist struck by Jihānshāh who was Tughrilshāh's son. For Rukn al-Dīn Sulaimānshāh, the ruler of Toqāt, only copper coins are known. Although the place and date of minting are not mentioned, it is very likely that they were minted in Toqāt. These copper coins display the image of a horseman with a halo around his head holding a halberd with three prongs.⁸³ Single examples of this coin are found in four different collections in Istanbul, Cairo, Paris, and the Broome collection in England.⁸⁴ In each case, the reverse contains the malik's title, Malik al-Qāhir.

The copper coins minted by Qutb al-Dīn Malikshāh (malik of Siwās and Aqsarāy), also have the image of the horseman. The horseman is crowned with a halo, a sign of divinity. A figure of Victory appears on the right side of the rider's back. Several of Malikshāh's copper issues have been preserved in Istanbul, Marseilles, and Paris.⁸⁵ On all three examples, the malik's title Abū al-Fath appears on the reverse.

The copper coins of Qaisarshāh (malik of Malatīa), are found in Istanbul, the Mitchener catalogue, and Paris.⁸⁶ These coins display the malik's title al-Malik al-Mu'ayyad on the reverse and the figure of a horseman (sometimes with a spear in his hand and hunting a wild animal) on the obverse.

Muhy al-Dīn Mas'ūd who was probably the Malik of Anqara between 1186–1204 minted coins in which the legends are found

⁸² Artuk, vol. 1, 1062; *Marseille*, 215; al-Ush, 175.

⁸³ Īsmā'il Ghālib (above, n. 4), p. 17.

⁸⁴ Artuk, 1066; Nicol, 3379; *Bibliothèque*, 1693; Broome, 170.

⁸⁵ Artuk, vol. 1, 1067; *Marseille*, 219; *Bibliothèque*, 1623.

⁸⁶ Artuk, vol. 1, 1068; Mitchener, 959; *Bibliothèque*, 1629.

within a square frame and the date of minting is located on the four corners. An example of one of his silver issues is found in Istanbul. It was minted in Anquara in 587 and bears the phrase al-'Abd al Ḍa'if al-Muhtāj ilā rahmat Allāh.⁸⁷ The Istanbul collection also has a copper coin minted in 590 which displays the same phrase.⁸⁸ Other examples of this copper issue, probably dating from sometime after 590, are found in Marseille and Paris.⁸⁹

Mughīth al-Dīn Tughrīlshāh (who was originally the ruler of Albistān and later of Arzurūm after its capture from the Saltūg-oglu)⁹⁰ minted both silver and copper coins. He minted silver coins in Arzurūm bearing the following dates: 608 (1211/2), 613 (1216/7), and 616 (1219/20). One of the peculiarities of these silver coins is that instead of dirham they are called dīnār.⁹¹ These coins bear the name of the Abbasid Caliph al-Nāsir li-Dīn Allāh and his titles al-Imām and Amīr al-Mu'minīn. The copper coins of Mughīth al-Dīn Tughrīlshāh have neither date nor place of minting. In place of Tughrīlshāh (the name as it appears on his silver coins), an abbreviated form of his name, Tughrīl, appears on his copper coins. These coins are of a single type and contain a horse which is looking to the right with a horseman holding a three-pronged halberd.⁹² Two of Tughrīlshāh's silver coins, both minted in Arzurūm and both bearing the mint date 608, have been preserved. One of them is in Istanbul and the second is listed in the Mitchener catalogue.⁹³ Both of these coins bear the malik's title Abū al-Fath and his epithet Mughīth al-Dunyā wa al-Dīn. Examples of Tughrīlshāh's copper issues are located in Istanbul, Marseilles, and Paris.⁹⁴ These coins contain the image of a horseman on the obverse, and the reverse displays the same title and epithet as on his silver coins.

⁸⁷ Artuk, vol. 1, 1069.

⁸⁸ Artuk, vol. 1, 1070.

⁸⁹ *Marseille*, 221; *Bibliothèque*, 1630.

⁹⁰ See n. 54.

⁹¹ Ḥsmā'īl Ghālib (above, n. 4), p. 14.

⁹² Ḥsmā'īl Ghālib (above, n. 4), p. 13.

⁹³ Artuk, vol. 1, 1071; Mitchener, 960.

⁹⁴ Artuk, vol. 1, 1072; *Marseille*, 218; *Bibliothèque*, 1615.

The Malik of Arzurûm, Rukn al-Dîn Jihānshāh who ruled from 1225 to 1230 following the death of his father Tugrīlshāh,⁹⁵ struck copper coins. One of his copper coins dated 626 has a Byzantine style image of a ruler sitting on his throne with a halo around his head. The reverse of this coin contains Jihānshāh's titles Rukn al-Dunyā wa al-Dîn and Abū al-Fath.⁹⁶

TITLES

The first Anatolian Seljuq ruler whose coins have been encountered is Mas'ūd I. His coins display the title al-Sultān al-Mu'azzam which became traditional on the later coinage of the Anatolian Seljuqs. When his elder brother Muhammed Tapār died (24 Zilhijja 511/18 April 1118)⁹⁷ and was succeeded by his son Mahmūd, the Great Seljuq Sultan Sanjar refused to recognize Mahmūd. He took him prisoner at the battle of Sāva on 2 Jumāda'l-ūlā 513/11 August 1119. Upon his accession to the throne Sanjar adopted the title Sultan al-A'zam.⁹⁸ The fact that Mas'ūd I (after Sanjar fell prisoner

⁹⁵ See n. 58.

⁹⁶ *Bibliothèque*, 1620.

⁹⁷ Imād al-Dîn al-Kātib al-Isphāhānī (above, n. 8), p. 115; Ibn al-Athīr (above, n. 2), vol. 10, p. 525; Abū al-Faraj (above, n. 12), vol. 2, p. 335; Abī al-Fidā (above, n. 10), vol. 2, p. 240; *Urphali Mateos Vekayināmesi Ve Papaz Grigor'in Zeyli*, trans. Hrant D. Andreasyan (Ankara, 1962), p. 252; Vardan, *Türk Fülûhatı Tarihi*, trans. Hrant D. Andreasyan, *TED* (İstanbul, 1937), vol. 1, 2, p. 194. Sadr al-Dîn Abū al-Hasan al-Husaynī (above, n. 8), p. 57; Abū al-Faraj (above, n. 10), p. 347; Sibṭ Ibn al-Cawzī (above, n. 64) (Haydarabad, 1951), vol. 1, p. 69, and Ahmad b. Mahmūd (above, n. 2), vol. 2, p. 42, all report Muhammad Tapar's death as 11 Zilhijja 511.

⁹⁸ Imād al-Dîn al-Isphāhānī, *Zubdat al-Nusra* (above, n. 8), pp. 117–24; Sadr al-Dîn Abū al-Hasan al-Huseynī (above, n. 8), pp. 61–62; Ibn al-Athīr (above, n. 2), vol. 10, pp. 551–52; Muhammad b. Alī b. Sulaimān al-Rāwandī, *Rāhat al-Sudūr wa Āyat al-Surūr*, trans. Ahmed Ateş (Ankara, 1957), vol. 1, pp. 165–67. It appears that the title Sultān al-A'zam was also used on Sanjar's coins. Concerning coins bearing the same title minted between 512 and 529 and (1118–35, see Coşkun Alptekin, "Selçuklu Paraları," *Selçuklu Araştırmaları Dergisi* (Ankara, 1971), vol. 3, pp. 438, 531.

to the Oghuz, Muharram 548/April 1153)⁹⁹ used the title al-Sultān al-Mu'azzam on the coins he possibly struck in Sanjar's honor may be regarded as a sign that he recognized Sanjar as his superior.

The title on the coins of Mas'ūd I's son, Qilijarslān II, is al-Sultān al-Mu'azzam. His epithet, Izz al-Dīn, however, is not encountered on any of his coins.¹⁰⁰

Qilijarslan II appointed each of his eleven sons to administer the various regions of the country. In the areas they controlled they also used the title Malik. Since they were subject to their father they could not take the title Sultān, even though they ruled as semi-independent sovereigns.¹⁰¹ One of these maliks, Malikshāh (Malik of Siwās and Aqsarāty), used the title Abū al-Fath on his silver and copper coins. But his epithet, Qutb al-Dīn did not appear on any of his coins. Sulaimānshāh, the Malik of Toqāt, used the title al-Malik al-Qāhir on his copper coins. But his epithet, Rukn al-Dīn does not appear on any of his coins. The title Abū al-Fath is displayed on the silver and copper coins of the Malik of Arzurūm, Tughrilshāh b. Qilijarslān II, in addition to his epithet, Mughīth al-Dunyā wa al-Dīn. On the copper coins struck by Jihānshāh, who became the Malik of Arzurūm in his place, both his title, Abū al-Fath, and his epithet, Rukn al-Dunyā wa al-Dīn, are used. The Malik of Angūria (Anquara) had no titles inscribed on either his silver or his copper coins; nor does his epithet, Muhi al-Dīn appear.

METROLOGICAL CONSIDERATIONS

The main denomination of the monetary system of the Anatolian Seljuqs was the silver coin known as the dirhem, 'adad, or aqcha-i Rūm.¹⁰² The dirhem was the accepted standard for state financial institutions such as taxes and officially fixed prices (narkh) and for

⁹⁹ See n. 2.

¹⁰⁰ İsmā'il Ghālib (above, n. 4), p. 6.

¹⁰¹ See n. 21.

¹⁰² Rashīd al-Dīn Faḍl Allāh, *Tārīkh-ı Mubārak-ı Ghāzānī* (London: Karl Jahn 1940), p. 282; A. Zeki Velidī Togan, *Umumî Türk Tarihi'ne Giriş* (İstanbul, 1981), p. 301.

social institutions such as waqfs, as well as for economic and commercial activities of all kinds and for all other measures of value.¹⁰³ The standard of purity of these dirhems¹⁰⁴ was between eighty and ninety percent.¹⁰⁵ The metrology of the silver coins struck by the Anatolian Seljuqs was based on the 'Orfi dirhem¹⁰⁶ of 16 qarats¹⁰⁷ with an official weight of 3.086 g.¹⁰⁸ This weight was lower than that of the

¹⁰³ Mustafa Akdağ, "Oshmanlı İmparalugunun Kuruluş ve İnkişafı Devrinde Türkiye'nin İktisadî Vaziyeti," *Bellelen* (Ankara, 1949), vol. 13, 51, pp. 514-15 and *Türkiye'nin iktisadî ve iclimal tarihi* (İstanbul, 1979), vol. 1, pp. 501-2.

¹⁰⁴ Purity means the proportion by weight of a precious metal within a metal alloy, Hasan Farîd (above, n. 72), vol. 1, p. 129; F. Von Schrötter (above, n. 74), p. 190.

¹⁰⁵ İsmâ'il Ghâlib (above, n. 4), p. 8; Hasan Farîd (above, n. 72), vol. 1, p. 160.

¹⁰⁶ Two important metrological standards for dirhems were the shar'î used in Egypt and, the 'orfi or mîrî, used by the Anatolian Seljuqs, Sulaimân Sûdî, *Usûl-i Maskûkât-ı 'Othmânîa wa Ajnabîa* (İstanbul, 1311), pp. 18-19. The shar'î dirhem was based on a grain of barley and was 14 qarats. The 'orfi dirhem was based on a grain of wheat and weighed 16 qarats, see Halil Sahillioğlu, "Kuruluştan XVII. Asrın Sonlarına Kadar Osmanlı Para Tarihi Üzerinde Bir Deneme" (Ph. D. diss., İstanbul, 1958), p. 5.

¹⁰⁷ A qarat is a carob seed and four grains of wheat equaled one qarat under the 'orfi system, al-Maqrîzî, *al-Nuqûd al-Qadîma wa al-İslâmîa*, trans. İbrahim Hakkı Konyalı, *Eski ve İslamî Paralar* (İstanbul, 1946), p. 34; İbrahim Artuk, "Al-Nuqûd al-Qadîma wa al-İslâmîa," *Bellelen* (Ankara, 1953), vol. 17, 67, pp. 379-80; Sulaimân Sûdî (above, n. 106), p. 19; Halil Sahillioğlu (above, n. 106), p. 2. In the shar'î system a qarat was equal to three grains of barley, *EI.*, vol. 6, p. 735a, s.v. "Kirat" (E.V. Zambaur).

¹⁰⁸ Walter Hinz, *Islamische Masse und Gewichte* (Leiden, 1955), p. 5; Nejat Kaymaz, *Pervane Mu'inüddin Süleyman* (Ankara, 1970), p. 166. Since one qarat of an 'orfi dirham weighed 0.193 g in this case, one habba (grain of wheat) of such a dirhem weighed 0.048 g; 'Alî Beğ, "'Othmânî İmparatorlughunun İlk Sikkasi wa İlk Aqchalari," *Târtkh-i 'Othmânî Anjumani Majmuası* (İstanbul, 1334), vol. 8, 48, p. 359, reports the weight of a silver coin of the Anatolian Seljuqs as one shar'î dirhem, i.e., 14 qarats. The weight of the 14 qarat shar'î dirhem, is 2.97 g, Hinz (above, n. 108), p. 2; F. Von Schrötter (above, n. 74), p. 145; *EI.*, vol. 3, 594b, s.v. "Dirhem" (E. V. Zambaur). In the shar'î system three habbas (grains of barley) equalled one qarat. The weight of one habba was slightly less than 0.071 g, and the weight of one qarat was 0.212 g. The Seljuq dirhems bore no relation to the dirhems of the shar'î system of the classical Islamic period, but were based on the 'orfi mithqâl of Egypt and weighed two-thirds of the Egyptian mithqâl's 4.68 g, see Hinz (above, n. 108), pp. 4-5.

Abbasid dirhems on which they were modeled, which were also 16 qarats but had a weight of 3.125 g.¹⁰⁹

The official dinārs of the Anatolian Seljuqs on the other hand were 24 qarats and weighted 4.81 g.¹¹⁰ This weight is higher than that of the 'orfī mithqāl of Egypt, which was also 24 qarats but weighed only 4.68 g.¹¹¹ Nevertheless, an examination of all the gold coins issued by this state has shown that their weights varied between 3.72 and 5.40 g but that they were usually between 4.35 and 4.45 g.

In regard to Anatolian Seljuq copper coins, I did not find any information about their weights and measures in the sources. From my examination of the various catalogues mentioned above, it is apparent that the weight of Mas'ūd I's copper piece without a mint and date is between 4.18 g and 5.35 g (see catalogue, 1).¹¹² Qilijarslān II's undated copper coin without a mint varies in weight between 2.25 and 3.85 g (see catalogue, 2)¹¹³ and the copper coin of the Malik of Sīwās and Aqsarāy, Qutb al-Dīn Malikshāh, is found in weights ranging from 2.92 g to 3.95 g (see catalogue, 3).¹¹⁴ The copper piece of the Malik of Toqāt, Rukn al-Dīn Sulaimānshāh, whose coins are larger in diameter and weigh more than those of the other Maliks,

¹⁰⁹ Hinz (above, n. 108), p. 3; and "Die Bestimmung Von Mithqāl Und Dirhem," 60. *Doğum Yılı Münasebetiyle Zeki Velidi Togan'a Armağan (Symbolae in Honorem Z. V. Togan)* (İstanbul, 1950-55), p. 266.

¹¹⁰ Hinz, *Islamische Masse und Gewichte* (above, n. 108), p. 5, and *Die Bestimmung Von Mitqāl Und Dirhem*, p. 269.

¹¹¹ Hinz, *Islamische Masse und Gewichte* (above, n. 108) pp. 4-5; and "Die Bestimmung Von Mithqāl Und Dirhem," pp. 267-68.

¹¹² The weights of Mas'ūd I's copper coins without a date or mint are as follows: 5.55 g; Artuk, vol. 1, p. 350, 1059; 4.34 g, Hennequin, *Marseille*, p. 42, 213; 4.18 g, Hennequin, *Bibliothèque*, p. 675, 1599. No weight is given by Broome, p. 111, 169.

¹¹³ The weights for this copper coin of Qilijarslān II which displays the image of a horseman but does not list a mint name or date are as follows: 3.85 g, Artuk, vol. 1, p. 351, 1062; 3.45 g, Hennequin, *Marseille*, p. 42, 215; 2.80 g, Hennequin, *Bibliothèque*, p. 678, 1604; 2.25 g, al-Ush, p. 22, 175. There is no weight given for Mitchener, p. 170, 954.

¹¹⁴ Weights for the copper coinage of the Malik of Sīwās and Aqsarāy, Malikshāh, are 3.95 g, Hennequin, *Bibliothèque*, p. 684, 1623; 2.92 g, Hennequin, *Marseille*, p. 42, 219.

varies between 7.20 and 7.33 g (see catalogue, 4).¹¹⁵ The copper coins of the Malik of Anqara, Muhy al-Dīn Mas'ūd, is listed with very different weights (see catalogue, 5). For example, there are some weighing as little as 4.93 g and others as much as 6.87 g.¹¹⁶ In regard to the silver coin struck in Arzurūm in 616 by the Malik of Arzurūm, Mughīth al-Dīn Tughrīlshāh (see catalogue, 6), it has weights varying between 2.70 g (according to an investigation of the Istanbul Yapı Kredi Bank and Istanbul Archaeological Museum catalogues)¹¹⁷ which are less than 14 $\frac{1}{4}$ qarats (2.748 g) and lighter than the 16 qarat and 3.086 g Anatolian Seljuq official dirham weight. A copper piece of the same Malik without a mint and date weighs between 3.60 and 5.56 g (see catalogue, 7).¹¹⁸ As for the copper coin dated 626 without a mint of the Malik of Arzurūm Rukn al-Dīn Jihānshāh, it is found with a weight of 3.35 g (see catalogue, 8).¹¹⁹

It is apparent from the examination of the material from the recently published catalogues that the Seljuq coins belonging to the ANS collection represent one of the most important sources for the study of Anatolian Seljuq coinage. Two of the ANS coins in particular are rarely encountered examples of Anatolian Seljuq coinage. The first of these (Plate 23, 1) is the copper coin of unknown date and place of minting belonging to the reign of Mas'ūd I with the bust of the Byzantine Emperor Alexios Comnenos I on the obverse and the sultan's title al-Sultān al-Mu'azzam on the reverse. The second rare

¹¹⁵ The weights for the large diameter copper coin of the Malik of Toqāt, Sulaimānshāh, are 7.33 g, Hennequin *Bibliothèque*, p. 703, 1693; 7.24 g, Nicol, p. 114, 3379; 7.20 g, Artuk, vol. 1, p. 352, 1066. A weight is not given for Broome, p. 112, 170.

¹¹⁶ The weights for the copper coin of the Malik of Anqara, Mas'ūd, are 6.87 g, Hennequin, *Marseille*, p. 42, 221; 4.93 g, Hennequin, *Bibliothèque*, p. 686, 1630.

¹¹⁷ For the silver coinage struck by Malik Tughrīlshāh in Arzurūm in the year 616, the weights are 2.70 g, Yapı Kredi Collection, 8341; 2.73 g, Reshad Beg Collection, Istanbul Archaeological Museum, 725.

¹¹⁸ For the undated copper piece of Tughrīlshāh without a mint name, the weights are 5.56 g, Hennequin, *Bibliothèque*, p. 681, 1615; 4.49 g, Hennequin, *Marseille*, p. 42, 218; 3.60 g, Artuk, vol. 1, p. 353, 1072.

¹¹⁹ The weight of the copper piece of the Malik of Arzurūm, Jihānshāh, which was struck in 626 but does not display a mint name, is 3.35 g, Hennequin *Bibliothèque*, p. 683, 1620. Mitchener, p. 171, 961, does not give a weight.

coin (Plate 23, 3) is the copper coin of unknown date and place of minting belonging to the Malik of Sīwās and Aqsarāy Malikshāh. The obverse of this coin shows a horseman with a figure of Victory behind him and the malik's title Abū al-Fath on the reverse.¹²¹ The ANS collection also contains two rare copper coins belong to the Maliks of Anqara and Arzurūm. The first of these belongs to Mas'ūd, the Malik of Anqara. This coin (Plate 23, 5) contains the phrase al-'Abd al-Ḍa'if al-Muhtāj ilā rahmat Allāh. Its date of minting is given as 590, but no place of minting is mentioned. The last coin (Plate 23, 8) belongs to the Malik of Arzurūm, Jihānshāh, and contains the image of a ruler sitting on his throne on the obverse. The reverse displays the title Abū al-Fath and the epithet Rukn al-Dunyā wa al-Dīn. This coin was minted in 626, but the place of minting is not indicated.

**RECONSTRUCTING THE BEACH-GRÜNTAL
HOARD OF COUNTERFEIT HALFPENCE:
THE MONTCLAIR, NEW JERSEY (1922) HOARD**

(PLATES 24–27)

JOHN M. KLEEBOERG

Counterfeit British and Irish halfpence made up much of the low denomination circulating medium of Britain's North American colonies and the early United States.¹ The extent of the problem was clear as early as 1753, when a bag of coppers was examined in New York City, and nearly a third was found to be counterfeit, many of them cast in sand.² The situation worsened as the eighteenth century proceeded, culminating in the New York City copper panic of August 1789. It is difficult, however, to determine which varieties should be attributed to a mint in what is now the United States. Many counterfeit halfpence never left Britain, some just circulated in Ireland, and counterfeit British halfpence circulated widely in Canada in the early nineteenth century. One way to determine the United States-made counterfeits is through die linkages to the state coinages of Connec-

¹ The author thanks Henry Grünthal, Philip Mossman, Eric P. Newman, and Mike Ringo for their assistance and suggestions. He also thanks the staffs of the Montclair Free Public Library and the New York Public Library.

² Kenneth Scott, *Counterfeiting in Colonial New York*, ANSNM 127 (1953), p. 102; Eric P. Newman, "American Circulation of English and Bungtown Halfpence," in Eric P. Newman and Richard G. Doty, *Studies on Money in Early America* (New York, 1976), p. 144.

ticut and Vermont, and from them to the well known issues of Machin's Mills in Newburgh, New York. A second method is through punch linkages to known American issues, and an expansion of this technique is the identification of distinctive American-style punches. A third identification method, first pointed out by Eric P. Newman and expanded upon by Walter Breen, is the unfimbriated Union Jack in the shield.³

Evidence of American circulation can bolster an argument for American manufacture. We derive evidence for circulation from two sources: by identifying the counterfeit undertypes over which state coppers were struck and by examining hoards. There are two documented hoards of counterfeit halfpence, the Stepney, Fairfield County, Connecticut (1950) hoard and the Philadelphia, Pennsylvania highway (1975) hoard.⁴ The purpose of this article is to reconstruct a third hoard of counterfeit halfpence.

In the course of assisting Philip Mossman with finding ANS material for his book, *Money of the American Colonies and Confederation*, Dr. Mossman and I came across a tray labeled "imitations of regal coinage." The tray contained evasive halfpence, arranged by Atkins number, and numerous British and Irish counterfeits. There were a

³ Eric P. Newman, "A Recently Discovered Coin Solves a Vermont Numismatic Enigma," in Harald Ingholt, ed., *Centennial Publication of the American Numismatic Society* (New York, 1958), p. 541; Walter Breen, *Walter Breen's Complete Encyclopedia of U.S. and Colonial Coins* (1988), p. 98. Byron Weston, however, has recently argued, "Single crossbars should not be assumed to indicate American manufacture," Byron Weston, "Evasion Hybrids: A Commentary on Counterfeit Halfpence & Farthings (TN-161)," in *The Colonial Newsletter*, 34, 3 (November 1994), p. 1467.

⁴ On the Stepney, Connecticut (1950) hoard see Walter Breen, "Survey of American Coin Hoards," in *The Numismatist*, 65, 1 (January, 1952), pp. 20-24; Eric P. Newman, "A Recently Discovered Coin Solves a Vermont Numismatic Enigma," in *Centennial Publication of the American Numismatic Society*, ed. Harald Ingholt (New York, 1958), pp. 531-42; Edward R. Barnsley, "A Late Date Analysis of the Fairfield Hoard," in *The Colonial Newsletter* 33, 2 (July 1993), pp. 1383-84; on the Philadelphia, Pennsylvania (1975) hoard, see Eric P. Newman and Peter P. Gaspar, "The Philadelphia Highway Coin Find," in *The Numismatist* 91, 3 (March 1978), pp. 453-67; Peter P. Gaspar and Eric P. Newman, "An Eighteenth Century Hoard from Philadelphia," in *Coin Hoards* 4 (London, 1978), pp. 127-30.

number of Machin's Mills issues in this tray, most of them donated by Henry Grünthal in 1975.

Grünthal was born in 1905 and worked in Berlin for his father's coin firm of Robert Ball Nachfolger. He emigrated to the United States shortly before the outbreak of the Second World War. He worked for a time at Stack's, and later as an independent coin dealer. In 1953 he joined the staff of the American Numismatic Society, eventually becoming curator of medieval and foreign coins.

When I began to catalogue the counterfeits in the Grünthal donation, it became clear that this donation was in a class by itself—it more than doubled the existing ANS collection of Machin pieces. When I had finished cataloguing and relabeling these counterfeit half-pence I showed the coins to Eric P. Newman. He pointed out that many of the coins had a curious yellow-green patina, and he suggested they may have come from a hoard, perhaps the Stepney hoard. Grünthal is a very advanced “cherry-picker” of coins, and so I had originally supposed that these were Machin pieces which he had cherry-picked from junk boxes. When I asked Grünthal about them, however, there was no glint of recognition. Machin varieties are very easy to identify once you know them (the bust has a characteristic style) but Grünthal seemed to have no recognition for a Machin piece. To him, they were just junk counterfeits. I then asked him where he got the coins. He said he obtained them when he bought Harry Prescott Clark Beach's collection. I mentioned that Eric P. Newman suggested that they were a hoard and Grünthal said he had always thought they might be. I then asked if they were part of the Stepney, Fairfield County, Connecticut hoard, but he had never heard of that hoard. If he is correct about the coins being obtained from Harry Prescott Clark Beach, then these coins cannot come from the Stepney hoard, because Grünthal bought the Beach collection in 1945 and the Stepney hoard was not discovered until 1950. These coins form a separate hoard.

The Harry Prescott Clark Beach collection was one of Grünthal's first coups as an independent dealer, and he was able to obtain it because Sydney P. Noe vouched for his *bona fides*. Grünthal bought the collection because it contained multiple thalers of Brunswick and pioneer gold. Beach also had an important collection of New Jersey coppers. These New Jersey coppers Grünthal sold to the American

Numismatic Society (accession number 1945.42), and they form the basis of that part of the Society's collection. The multiple thalers Grünthal sold to Paul A. Straub, who later donated them to the Smithsonian Institution. The counterfeit halfpence, however, remained with Grünthal until 1975.

The reason why he retained the counterfeits for 30 years may be because dealers guarantee the genuineness of the coins they sell. If a dealer receives a counterfeit or forgery and cannot return it to the person he bought it from, he is responsible for the loss. Machin pieces are not in the same class as modern forgeries because they were circulating counterfeits manufactured in America and are an important part of American numismatic history. A dealer more experienced in pre-federal American coins would have cherry-picked out the Machin pieces and resold them. Although Grünthal has an amazing universal numismatic knowledge ranging from Carolingian deniers to U.S. commemoratives, the Machin issues happened to be one of his few blind spots. To him, the Machin pieces were counterfeits, and he could not sell forgeries or counterfeits. In 1975 Henry Grünthal realized that the ANS might be interested in these pieces, so he cleaned out the back of his safe deposit box and donated them. This was very fortunate for the ANS: it meant that the hoard arrived with the Machin pieces still intact.

Not everything in the Grünthal donation forms part of the hoard, however. The donation is clearly the dregs of the Beach collection. There are enough coins which could not have formed part of the hoard (e.g. a battered Oak Tree shilling and one of Horace Grant's 1935 fakes of the Rhode Island token) so we cannot assume that all the coins in donation 1975.117 are part of a hoard. I have, therefore, reconstructed the hoard by selecting the coins in the accession 1975.117 which share a common patina—a greenish-yellow patina with much dirt. There are 34 coins in total: 33 counterfeit halfpence, plus 1 Rosa Americana penny. To these 34 coins, however, I have added 5 New Jersey coppers from accession 1945.42. The reason for including these additional coins will be given below.

American-made counterfeit British halfpence are sometimes grouped under the general heading of "Machin's Mills." We have a fairly good understanding of which are the Machin's pieces because the bust is

very distinctive and there are numerous die links to the state coppers. In his *Encyclopedia*, Walter Breen divided counterfeit British halfpence into three series: Machin's Mills (992–97), Mould and Atlee (1002–9), and Bungtown mints (974–75).⁵ Gary Trudgen has developed a scheme which allocates these halfpennies into three groups,⁶ which has been adopted by *A Guide Book of United States Coins*:⁷ group 1, which is assigned to Mould and Atlee and corresponds to Breen 1003–8 (Vlack 2–9 and 24); group 2, which is assigned to Ephraim Brasher and John Bailey (or Atlee and Bailey), and comprises Breen 996 and 1002 (Vlack 1 and 17); and group 3, which contains the classic Machin's Mills pieces, and comprises Breen 992–97 (Vlack 11–13, 18–21, and 23). Note that group 2 includes pieces that Breen assigned to Mould and Atlee as well as to Machin's Mills, and one Breen variety, 996, contains both group 2 and group 3 halfpence. Another variety, Breen 1009/Vlack 10, may or may not belong in one of these three groups. The photograph of the obverse in Breen shows a straight, pointy nose which I would associate with the Brasher and Bailey style, but the photograph of the obverse on Vlack's plate shows a double chin which is more characteristic of the Machin's style. The date on the reverse, 1777, is not listed in the *Guide Book*, apparently because many students of this series do not believe the coin to be a Machin's product.⁸ The *Guide Book* does not separately list the Bungtown issues, although Breen and Vlack do (Breen 974–75, Vlack 14 and 16). By Bungtown varieties, I mean struck counterfeit halfpence generally agreed to be of American manufacture which were not made by the makers of group 1 (Mould and Atlee), group 2 (Brasher and Bailey) or group 3 (Machin's Mills).

The three groups can be distinguished as follows. The group 3, or Machin's Mills pieces, are the easiest of all to identify, because of the pursed lips of George III, so that George III almost appears to be

⁵ *Breen's Encyclopedia*, pp. 89–90, 96–99.

⁶ Gary A. Trudgen, "James Atlee's Imitation British Halfpence," in *The Colonial Newsletter* 27, 1 (March 1987), pp. 965–79.

⁷ R. S. Yeoman, *A Guide Book of United States Coins*, 46th ed. (1993), hereafter *Guide Book*.

⁸ See also the comments in Byron Weston, "Evasion Hybrids" (above, n. 3), p. 1467, suggesting that Vlack 10 is punch linked to evasive halfpence.

wearing lipstick. The group 2, or Brasher and Bailey pieces, are not difficult to identify. The 1747 halfpenny is unusual in that it is the only George II counterfeit currently considered struck in America and although the other Brasher and Bailey pieces share a common date (1787) with the Machin's Mills pieces, the bust has an unusually large pointed nose. The nose line is also in a straight line with the forehead. The Mould and Atlee pieces are more difficult to identify, but the bust style tends to be tall with no distinct lips and a weak chin (on Machin's pieces the chin, and often the cheekbones, are quite pronounced); the portrait is of a thinner George III than the rather fat and jowly George III who appears on the Machin's Mills pieces. The *Guide Book* gives the following years for the manufacture of the pieces: Mould and Atlee, 1786, in New York City; Brasher and Bailey, first half of 1787, in New York City; and Machin's Mills, second half of 1787 and 1788, near Newburgh, New York. This appears to be the best current consensus among researchers in this very complicated field.

The latest date in the hoard is 1788. Some of the coins in the hoard are extremely worn, notably one dated 1787 (1975.117.39, 22 below), which is both very worn and has had a hole drilled through it. The hole looks as though it may be some sort of cancellation mark rather than a way of defacing the coin. Another cancellation mark is a grafito in the shape of a large X from side to side of the coin, see coin 1975.117.36 (44). Unlike coins from normal mints we cannot use wear as a way of dating Machin counterfeits, because the coins were made pre-worn, with deliberate mishandling of the dies, so that people would not look too closely at the coins when they were passed. Two coins are in fairly good condition, but have holes drilled in them, both around the same place (to the left of the head of Britannia), suggesting that they were worn as jewelry. Another coin has two triangular gashes in it, which may have been to make it into a humdinger. A humdinger is a child's toy, where a child puts a string through these two holes and then whizzes the coin around, so that the coin makes a loud humming noise.⁹ The two triangular gashes could also have been used to make

⁹ Edward R. Barnsley, "Humdingers and Buzzers," in *The Colonial Newsletter* 3, 2 (April-June 1962), pp. 3-4.

the coin into a button. Edward Barnsley argued that halfpence were too big to make into buttons, but I see no reason why they could not have served as a button for a greatcoat, or a decorative button. The Rosa Americana piece is among the most worn of the coins in the hoard, and has a huge hole in it. These holes and gashes suggest that the coins saw some circulation before the coins were hoarded. On the other hand, there are many coins in very good condition and with weights on the heavy side, so the hoard was probably not put together too long after the coins were minted. I think the hoard was closed sometime in the 1790s.

We should contrast the circumstances surrounding the deposit of the two other important hoards of counterfeit halfpence: the Philadelphia, Pennsylvania (1975) hoard and the Stepney, Connecticut (1950) hoard. The Philadelphia highway hoard consisted of cast counterfeit halfpence, most of them identical and rather close to what Walter Breen would term a "mint sample."¹⁰ The circumstances of its deposit are not difficult to guess. It seems probable that a passer of counterfeits was afraid of being caught and threw his counterfeit halfpence into the Delaware River.¹¹ The Stepney hoard is equally interesting in the circumstances of its deposit. Although it contained Connecticut, Vermont, and Nova Eborac coppers, as well as counterfeit halfpence (Eric P. Newman says about a dozen Machin pieces),¹² Breen says it did not include any Massachusetts, New Jersey, or Fugio coppers. The Stepney hoard may well consist of coins which had already been rejected, and were set aside to wait a better day while their owner continued to spend Massachusetts, New Jersey, and Fugio coppers, which were still being accepted at the time of the deposit of the Stepney hoard. If this theory is correct, then the date of deposit of the Stepney hoard antedates the New York City copper panic of

¹⁰ Walter Breen, "Survey of American Coin Hoards," in *The Numismatist* 65, 1 (January 1952), p. 7.

¹¹ Eric P. Newman and Peter P. Gaspar, "The Philadelphia Highway Coin Find," in *The Numismatist* 91, 3 (March 1978), pp. 453–67; Peter P. Gaspar and Eric P. Newman, "An Eighteenth Century Hoard from Philadelphia," in *Coin Hoards* 4 (London, 1978), pp. 127–30.

¹² Letter from Eric P. Newman to the author, February 15, 1993.

August 1789.¹³ An argument against this is that many coins in the Stepney hoard show heavy wear, yet if the hoard was deposited in 1789 they would have been in circulation for only two years. Thus others would argue that the heavy wear indicates that the Stepney hoard must have been deposited later, sometime in the 1790s.

We also have to explain why coins which are basically worthless should be set aside in the Beach-Grünthal hoard. One possibility is that the coins were overtaken by events: the owner thought he could pass them on, but then the copper panic came, and all coppers were rejected for a period, and so he set them aside for a better day and possibly hid them so they would not be stolen.¹⁴

The hoard was found among the effects of Harry Prescott Clark Beach after his death. Beach lived in Upper Montclair, New Jersey, and presumably acquired the hoard locally as a hoard of such low value would not travel very far. Beach bought the hoard before World War II, when coin prices were much lower, and coins less likely to travel far. Beach was born in Hamden, Connecticut, in 1870 or 1871. He attended the preparatory school run by his father, the Beach-Clark School of New York City, and attended Columbia Law School, graduating in 1891. He fought in the First World War as a private in Company C, 117th Field Service Battalion, 42nd Division, United States Army. He served as General Counsel for James A. Hearn and Son, the New York City department store, and he retired in 1932. He was President of the Fourteenth Street Association. He was a president and member of the executive committee of the New Jersey Numismatic Society and a member of the New Jersey Archaeological Society. In 1930 he was president of the Montclair chapter of the Sons of the American Revolution. He did not join the American

¹³ Walter Breen, "Survey of American Coin Hoards," in *The Numismatist* 65, 1 (January 1952), pp. 20-24; Eric P. Newman, "A Recently Discovered Coin Solves a Vermont Numismatic Enigma," in *Centennial Publication of the American Numismatic Society*, ed. Harald Ingholt (New York, 1958), pp. 531-42.

¹⁴ For a similar hoard of worthless coppers which were overtaken by events, see Robert Wallace McLachlan, "A Hoard of Canadian Coppers," in *The Canadian Antiquarian and Numismatic Journal*, 2nd ser., 1 (July 1889), pp. 27-34. McLachlan says, p. 34, "The hoard, then, was the contents of some commodious till when the hucksters edict went forth declaring the bulk of the currency of Canada illegal."

Numismatic Society until 1936 and he never appears to have joined the American Numismatic Association.¹⁵ Beach could have bought the hoard any time before July 1943.

There is a report of a hoard which sounds similar to that described above. *The New York Times* reported from Montclair, New Jersey, on July 21, 1922:

...Workmen digging today on the site of the mansion used by General Washington as his headquarters found old copper coins, one bearing the inscription, "British North America, 1724."

Dr. Maurice Cohen, who now owns the property, obtained some of the coins. The workmen are moving a ten-ton boulder from a corner of the property to the site of the Washington headquarters. It will bear a bronze tablet with a relief of the mansion and an inscription. The Sons and Daughters of the American Revolution have charge of the work. The mansion was razed fifteen years ago.¹⁶

The one coin whose description is given is garbled, but I think it is a Rosa Americana as a worn specimen might well be misread as North American, rather than Rosa Americana. Upon looking through the Grünthal donation of 1975.117, I found that there was one Rosa Americana among it, a penny of 1722, which shares the greenish-yellow patination of the other coins in the hoard. Upon examining this penny and noting its poor condition, plus the large hole near the date, the misattribution in the *New York Times* becomes very understandable. A number of Rosa Americana coppers have turned up in excavations and in stray finds in the United States.¹⁷ If a Rosa Ameri-

¹⁵ "Prescott Beach, Hearn Ex-Counsel. Former Vice-President Served Department Store 40 Years, Dies in Montclair at 72," in *The New York Times* (July 19, 1943); "H. Prescott Beach Dies at Montclair. Former Official of Hearn Department Stores Active in S. A. R. Groups," in *Newark News* (July 19, 1943), p. 20, col. 1. Both these clippings are from the Montclair History Collection of the Montclair Free Public Library. See also American Numismatic Society, *Proceedings* (New York, 1944) pp. 12-13. There is no obituary for Beach in the *Numismatist*.

¹⁶ "Find Colonial Coins of 1724. Workmen Unearth Them at Washington Headquarters Site," in *The New York Times* (July 22, 1922), p. 6, col. 8.

¹⁷ The inventory of American numismatic finds that I am currently compiling lists three isolated finds: Washington, Pennsylvania; Charleston, South Carolina; and Somerset, Rhode Island. Two Rosa Americana coins were also found during

cana was part of the hoard, then the hoard included at least one coin which was not a counterfeit; but perhaps it was rejected too, by a populace which had grown distrustful of all regal coppers. The worn condition and large hole in the Rosa Americana give reason enough to reject this copper if it were offered.

We can glean some more information from the report in the local newspaper, *The Montclair Times*:

On Thursday the workmen engaged in removing the boulder made an interesting find. While at work they dug up a number of old copper coins, about the size of a half dollar. One of the coins, on which all the other lettering is undecipherable, bears the inscription, "British North America, 1724." The inscription on one side of the other coin is "1781-E Pluribus Unum." On the other side are the words, "Nova Caeserea," *[sic]* which is the name by which New Jersey was originally known. Dr. Cohen is in possession of the two coins described. Those who have examined the older coin are inclined to believe that it may prove of considerable value.¹⁸

This report is the first indication that the hoard contained at least one New Jersey copper. Only one variety of New Jersey copper has the misspelling **CAESEREA**, but the pedigree of the two specimens known rules out their provenance to the Montclair hoard. The coin referred to is almost certainly a 1787-dated New Jersey copper, but we cannot tell which one from the description.

The report from the *Montclair Times* sends us back to look at another ANS acquisition—1945.42, which is the purchase from Henry Grunthal of Beach's collection of New Jersey coppers. Five coins in this acquisition have a patina which resembles that of the Montclair hoard. They are varieties Maris 17-K, 31-L (two examples), 38-Z, and 73-aa. Two of them (17-K and 38-Z) have the provenance "ex

excavations at Williamsburg, Virginia, and there was one Rosa Americana in the hoard of coins accumulated by the miser Aaron White of Connecticut, which was put together around the time of the Civil War. No Rosa Americanas were reported among the coins of the Philadelphia highway find, but there were three Wood's Hibernia halfpence of 1723.

¹⁸ "Huge Boulder Marks Historic Plot," in *The Montclair Times* (July 22, 1922), p. 1, cols. 1-2.

Beach, ex Bull." Who Bull was, I have been unable to determine. The spread of varieties with a Bull provenance indicate that this was a collection of New Jersey copper varieties which Beach bought as a starter set.¹⁹ Beach collected two examples of each variety, and I suspect the Bull provenance is a red herring: the specimen from Bull and the specimen from the Montclair hoard switched envelopes.

The report from Montclair fits extremely well with what I would expect in terms of when and where the Beach-Grünthal hoard was found, and I think the garbled description of the North American coin really describes the Rosa Americana of 1722. What clinches it for me is the involvement of the Sons of the American Revolution in setting up the tablet on the site of what had been Washington's headquarters. Not only was Harry Prescott Clark Beach a member of the Sons of the American Revolution, but he served as president of the Montclair chapter of the SAR in 1930. I am giving the Beach-Grünthal hoard as a formal name, the Montclair, New Jersey (1922) hoard, using Enno van Gelder's system of naming hoards by the find spot, plus the date found in parentheses.

The house which temporarily served as Washington's headquarters in Montclair was the homestead of the most prominent family of the area, the Cranes. In fact, we can make a reasonable guess as to who deposited the hoard—Israel Crane. He operated the first mercantile business in Montclair. The exact date he opened his business is unknown, but he was active before the turnpike opened in 1806. Crane also owned a stone quarry in Newark, and his shop served as the company store for the quarrymen. Despite the efforts of the SAR and the DAR, the Crane homestead was torn down at the beginning of the twentieth century. The site was later acquired by Dr. Maurice Cohen, who served as Montclair Town Physician between 1922 and 1947. Dr. Cohen granted the site of the boulder to the township of Montclair for use as a park.²⁰ It is ten feet by thirteen feet and was

¹⁹ The following varieties have Bull provenances: 6-C, 10-G, 11 1/2-G, 11-H, 12-I, 15-J, 15-T, 17-K, 20-N, 21-O, 23-P, 28-C, 28-S, 34-J, 34-V, 38-Z, 40-b, 42-c, 43-Y, 43-d, 44-c, 54-k, 55-l, 62-q, and 64-u.

²⁰ Sons of the American Revolution, Montclair Chapter, *The Story of Montclair: Its People in Peace and War Times* (1930), pp. 14, 46, 55, 56-57, 132, 142, 167; *State History of the New Jersey Daughters of the American Revolution* (Sea Isle City, New

listed as "the smallest park in the world" in Ripley's *Believe it or Not*. The boulder, with a plaque indicating that it was the site of Washington's headquarters, is still standing today (1995).

The coins have turned a greenish-yellow in color, and some also have bits of bright green patination. Some also have a reddish-brown patination, which may be iron oxide. The Stepney hoard was found in an iron kettle, and it is quite possible that these coins too were buried in an iron kettle; if the coins were in such a container, however, it is not mentioned in the newspaper articles.

The weights show a very wide range. In his *Encyclopedia*, Breen gives weights ranging from 5.4 g to 7.56 g for Machin pieces.²¹ In his *Money of the American Colonies and Confederation*, Philip L. Mossman gives a mean of 111.5 grains (7.23 g) for Machin's Mills pieces.²² Coins from the Montclair hoard range from 6.155 g to 8.468 g for Machin pieces, for a mean of 6.583 g including the holed pieces, and 6.738 g if we exclude them. The hoard is on average, then, lighter than the mean which Mossman found, although it does contain a number of fairly heavy coins weighing over 8 g.

I have tried to err on the side of caution in including coins in the hoard. Only when I truly felt that the patination was similar to other coins in the hoard did I include any particular coin. The reason I erred on the side of caution is because presence of a coin in the Montclair hoard is evidence of American circulation and may well be evidence of American manufacture as well, and I did not want to increase the number of American coins without good evidence. I have included remarks about the patination of the coins in the catalogue.

The Montclair hoard gives us a picture of what counterfeit halfpence were in circulation around the New York City area around the time of the copper panic. First of all, it shows that groups 1, 2, and 3 counterfeit halfpence circulated interchangeably, at the same place and around the same time. Although the place of manufacture lay outside

Jersey, 1929), pp. 116, 120. On Dr. Cohen see "Former Official Dies, 75," in *The Montclair Times* (December 5, 1968) p. 8, cols. 1-6.

²¹ Breen's *Encyclopedia*, p. 97.

²² Philip L. Mossman, *Money of the American Colonies and Confederation: A Numismatic, Economic and Historical Correlation*, p. 210.

the city in the case of the products of Machin's Mills, much of the distribution of the counterfeits ("smashing," "shoving the queer") probably took place in New York City itself. In New York City, many counterfeit coins in the nineteenth century were passed off in change by fruit vendors. People would buy fruit from the pushcarts on their way to the ferries, and in winter evenings it was easy to receive a few bad coins in change. Secondly, it confirms that one new variety of counterfeit halfpence (Vlack 24-72C) is indeed of American origin and did circulate over here. The hoard also confirms that one Bungtown variety, Breen 974, Vlack 14-84A, is indeed of American origin, 1975.117.18 (31). The hoard also gives us at least one new Bungtown variety, 1975.117.40 (29). The crudeness of this struck counterfeit and its presence in the hoard are to my mind arguments for considering it American in origin. Philip Mossman has made a very subtle argument in favor of the American origin of another coin in the hoard, namely 1975.117.45 (30). This coin is an Irish halfpenny overstruck on a double struck British George III halfpenny. The process of overstriking an Irish type on a British undertype, argues Mossman, makes no sense, because in Britain and Ireland Irish coins were worth less than British coins. The one place where it would make sense would be in America, where the values were equal. The other struck counterfeit (28), which I have also called Bungtown, may or may not be American in origin. It is rather skillfully done, and so may have been made by for export by a British maker of "hard-ware." No such hesitancy need restrain us from considering the three cast counterfeits in the hoard as being of American manufacture. Casting coins is more labor intensive than striking coins. A British manufacturer making brummagem for export after the mid-eighteenth century would not have cast his counterfeits, he would have struck them. The presence of cast counterfeits in an American hoard is a strong argument that the cast counterfeits were made locally.²³ Since we cannot use die studies or punch studies to determine the American

²³ Mossman, p. 121, where Mossman postulates that American-made cast counterfeits had to exist. Eric P. Newman has suggested that most 1749-dated cast counterfeits are probably of American manufacture because of the huge number of genuine 1749 halfpence and farthings shipped to North America. This makes excellent sense.

origin of cast counterfeits, the presence of these three cast counterfeits is very welcome. The presence of the 1749 cast counterfeit (34) confirms the widespread circulation of 1749 dated genuine halfpence in the thirteen colonies and the early United States. Any cast counterfeit of a 1749 halfpenny has a strong likelihood of being of American origin.

One question remains. The Stepney hoard contained both Machin's pieces and English-made counterfeits. This hoard, by contrast, is almost exclusively American—only the *Rosa Americana* was certainly, and the 1752 George II struck counterfeit was possibly, made in England. Why are there not more coins of English manufacture? I do not think either Beach or Grünthal separated out any English-made counterfeits. It may just be a reflection of variations in circulation patterns, and perhaps New England chose to import its counterfeits, while New York and New Jersey chose to make theirs.

CATALOGUE

All coins, with the exception of the *Rosa Americana* and the New Jersey coppers, are counterfeits of the standard British George III halfpenny, Seaby 3774, unless another Seaby reference is given. All die axes are 6:00 unless otherwise indicated. The descriptions include first a catalogue number, then the ANS coin number (all coins are from accessions 1975.117 and 1945.42), the date on the coin whether visible on the specific specimen or not, the weight, the die axis if it varies from 6:00, references to standard sources, and finally a short verbal description of the coin itself, usually of the patina. Some of the attributions were done by Mike Ringo, who is extremely accurate. I have double-checked all the attributions so any errors in attribution are therefore mine.

ROSA AMERICANA PENNY (William Wood, London and Bristol)

1. 1975.117.86, 1722, 6.080 g, 12:00, Breen 116, Nelson 9
Greenish patination; very dirty, bits of white corrosion. Large hole at 12 o'clock.

GROUP 1 COUNTERFEIT HALFPENCE
(Mould and Atlee, New York City)

There are two counterfeits which are dated 1772 (although the date is not visible on the specimens in the hoard). This variety was discovered by Richard August of Providence, Rhode Island, and attributed to Machin's Mills.²⁴ When Ringo identified the two specimens in our trays, he attributed them to Atlee. I have accordingly adopted Ringo's attribution, and since the group 1 counterfeits are largely identical with those which Breen ascribed to Mould and Atlee, I am including it as a group 1 counterfeit. The presence of these coins in the Montclair hoard provides welcome confirmation of their American origins. The grinding down of the obverse die so as to obliterate the legend is found on some Machin's pieces, compare the Vermont copper Breen 725, Ryder-Richardson 13, and Bressett 17-V.²⁵

2. 1975.117.33, 1772, 7.164 g, Breen 1004, Vlack 24-72C

Attribution by Mike Ringo. Spotty patination; in some places bright green, in some places reddish brown. The patination makes it a close sister of 1975.117.17.

3. 1975.117.34, 1772, 6.065 g, Breen 1004, Vlack 24-72C

Attribution by Mike Ringo. Ringo says that these two are rarity 7 (extremely rare, 4-12 known). The coin is very worn, but the light weight suggests that it may not have been all that well struck up to begin with. The coin is also quite dirty.

4. 1975.117.36, 1776, 7.674 g, Breen 1008, Vlack 6-76A

The coin is more brownish than greenish yellow, but it does have much the same dirt as the other coins in the hoard. The coin is in fairly good condition, too. On the reverse there are two thin lines going from one side of the coin to the other, making a large X, clearly a type of cancellation mark.

²⁴ Gary A. Trudgen, "New Machin's Mills Die Variety, Vlack 24-72C," in *The Colonial Newsletter* 25, 1 (June 1985), p. 908.

²⁵ Mossman, pp. 189-90, where he also mentions a contrary argument, made first by Charles Wyllis Betts and revived by Gary Trudgen, that the obliteration of the legend was not because of lapping the dies, but due to "honest wear."

**GROUP 2 COUNTERFEIT HALFPENCE
(Brasher and Bailey, New York City)**

5. 1975.117.35, 1787, 7.792 g, Breen 996, Vlack 17-87B
Greenish-yellowish color, dirt. The coin has a nail hole to the left of the head of Britannia, very similar to the nail hole in 1975.117.28 (27). This provides welcome confirmation that this coin and 1975.117.28 were once together in place and time; it confirms what we have argued from the common provenance and the patina.
6. 1975.117.44, 1787, 7.551 g, Breen 996, Vlack 17-87B
Greenish-yellowish color, dirty. There are a series of almost triangular gashes made on the obverse of the coin and a few on the reverse which may be some sort of cancellation mark.
7. 1975.117.41, 1787, 6.659 g, Breen 996, Vlack. 17-87B
Very dirty. Some bright green patina on the obverse.
8. 1975.117.42, 1787, 7.221 g, Breen 996, Vlack 17-87B
The usual dirt. The coin has the beginnings of a green patination, if you turn it in the light.
9. 1975.117.27, 1787, 7.872 g, Breen 996, Vlack 17-87A
Dirty. Some greenish yellowish color on the reverse. Other than that in fine condition.

**GROUP 3 COUNTERFEIT HALFPENCE
(Machin's Mills, Newburgh, New York)**

10. 1975.117.43, 1778, 6.385 g, 8:30, Breen 993, Vlack 12-78B
Pronounced green patination.
11. 1975.117.22, 1778, 6.962 g, Breen 993, Vlack 12-78B
Basic greenish yellow color underneath; coin is extremely dirty. The obverse device punch of this coin and of 1975.117.43 and that of a Vermont copper (Vlack VT-87C, Ryder-Richardson 13, Bressett 17-V) are very similar in style; they both have high cheekbones and a pronounced chin. They cannot be the exact same punch, because the arrangement of the ribbons is different, unless such details were later individually touched up after the punch had been put in the die.

12. 1975.117.19, 1778, 7.569 g, Breen 993, Vlack 13-78B

Greenish-yellow color, much dirt.

13. 1975.117.20, 1778, 6.155 g, Breen 993, Vlack 13-78B

Pronounced greenish-yellow color. There are streaky defects in the planchet, which appear to be a problem in the original copper (or brass) sheet.

14. 1975.117.38, 1778, 7.399 g, Breen 993, Vlack 13-78B

Quite pronounced green patination.

15. 1975.117.21, 1778, 6.64 g, Breen 993, Vlack 13-78B

Very pronounced dark coloring, which almost entirely obscures the light brassy color underneath. The major defects in this coin (notably a big flan crack at about 7:00 on the obverse) appear to be problems with the planchet in the mint, not a gash made subsequently.

16. 1975.117.31, 1788, 6.503 g, 5:00, Breen 999, Vlack 13-88CT

Greenish-yellowish color. The coin is excellent condition, except that the dies and the planchets by this time were fairly weak. An important coin, which links the Machin's type counterfeits to the issues of Connecticut; it has the inscription INDE*ET*—LIB* on the reverse (Independentia et Libertas).²⁶

17. 1975.117.37, 1787, 6.423 g, Breen 995, Vlack 18-87C

The coin is extremely worn; fortunately, Mike Ringo made the Vlack attribution for us, which is no mean feat. Some traces of green patination on the obverse.

18. 1975.117.23, 1787, 8.468 g, Breen 995, Vlack 19-87C

The coin is in superb condition; basic greenish yellow color, but a dramatic streak of green patination on the reverse, going from the A in BRITAN to the 8 in 1787.

²⁶ Walter Breen (*Breen's Encyclopedia*, p. 61) has argued that Independentia is bad Latin, and that therefore INDE ET LIB must stand for the French motto Indépendance et Liberté. I think that Connecticut legislators were more likely to use bad Latin, than good French.

19. 1975.117.25, 1787, 7.944 g, Breen 995, Vlack 19-87C
Greenish-yellow color, and the usual dirt.

20. 1975.117.24, 7.801 g, Breen 995, Vlack 19-87C
The coin has been made into what may be humdinger, a child's toy, by striking two triangular holes in it. The coin has some greenish yellowish color, and much dirt.

21. 1975.117.26, 1787, 7.802 g, Breen 995, Vlack 19-87C
Greenish-yellow color and rather dirty. On the obverse, the eye of George III has been gashed out (a classical numismatist would call this an example of *damnatio memoriae*). This might have been done by a zealous American patriot. In late die states of this variety the E, the X, and the period after REX begin to break up, as here and on the following coin.

22. 1975.117.39, 1787, 7.615 g, Breen 995, Vlack 19-87C
This coin is extremely worn and a large nail has been driven through it near the edge. It has the greenish-yellow color typical of the other coins in the hoard. This nail hole is different from those on 1975.117.28 and 1975.117.35. Serious die deterioration is clear at the E, the X, and the period after REX.

23. 1975.117.17, 1787, 8.10 g, Breen 995, Vlack 23-87C
The Vlack attribution is by Mike Ringo, who says the coin is R7+ (extremely rare, 4-12 known). Basic greenish-yellow color, dirt, some small traces of bright green patination, and also some reddish-brown, which may be iron rust from the original container of the hoard. Vlack 23-87C is an important variety as a link between the Machin's issues dated 1787 and those dated 1788.

24. 1975.117.30, 1788, 7.742 g, Breen 997, Vlack 23-88A
Extremely dark patination.

25. 1975.117.32, 1788, 6.91 g, Breen 997, Vlack 23-88A
The coin has a dark patination, which in some parts has turned very pale green, almost white.

26. 1975.117.29, 1788, 6.979 g, Breen 997, Vlack 23-88A
Dark patination. Much dirt.

27. 1975.117.28, 1788, 8.224 g, Breen 997, Vlack 23-88A

The coin is in excellent condition, except that there is a nail hole just to the left of the head of Britannia. The force of the blow was directed towards the reverse, and the position of the hole indicates that it may have been made to make the coin into some sort of necklace, with Britannia facing out. The coin has the usual greenish-yellow patina and dirt.

STRUCK COUNTERFEITS, SHARING THE SAME PROVENANCE
AND PATINATION OF THE ABOVE COINS
(Bungtowns)

The following coins, except 31, were not included by Vlack or Breen.

28. 1975.117.16, 1752, 6.655 g, counterfeit of Seaby 3719

A counterfeit of an old bust George II British halfpenny. Greenish yellowish color. There is also some spotty reddish brown patination.

29. 1975.117.40, date illegible, 5.843 g, counterfeit of Seaby 4614

A counterfeit of a George III Irish halfpenny. Greenish yellowish color, and pronounced dirt. A very crude, struck counterfeit. Obverse inscription CEORGI, reverse inscription HIBE, with most of the inscription struck off flan. The presence of this coin in this hoard means that we should probably consider this particular counterfeit of American manufacture, a Bungtown piece.

30. 1975.117.45, date illegible, 6.101 g, Irish halfpenny, counterfeit of Seaby 4614

The patination is not quite the same as on the other pieces in the hoard (on the obverse it has turned almost white) but there is some pronounced bright green patination on the reverse. I think we may consider this coin part of this hoard. The undertype is a doublestruck British George III halfpenny, dated 1775. The overtype is an Irish George III halfpenny, date illegible. Philip Mossman has made the important point that in Britain, it would make no sense to overstrike an Irish coin on an English one, because English coins are worth more. The one place where it would have been practical would be in the

United States, where the values were equal. According to this subtle argument, the Irish overtype is of American manufacture.

(North Swansea, Massachusetts)

31. 1975.117.18, 1784, 6.498 g, 10:00, Breen 974, Vlack 14-84A

The patination is more brownish than greenish-yellowish, but the coin has enough dirt on it so that I believe it came out of the same hoard. An important piece, its presence in this hoard confirms its American origin, which has long been suspected. Eric P. Newman has said, "The emaciated George III bust would have been the way a patriotic American counterfeiter would have wanted George III to appear in 1784."²⁷ Newman ascribes it to North Swansea, Massachusetts. Byron Weston has said, "without further evidence...this piece should only be considered of anonymous origin."²⁸ The Montclair hoard, however, provides us with this further evidence. Yet another argument for its American circulation and its American origin is its occurrence in old collections. Just as we find numerous 1749 halfpence in old collections, so we also find this piece. In addition to the two pieces in the ANS collection, for example, I came across one in November 1994 in the numismatic collection of the University Libraries of Notre Dame.

CAST COUNTERFEITS

32. 1975.117.14, 1729, 6.87 g, counterfeit of Seaby 3717

A counterfeit of a young bust George II British halfpenny. Very pronounced greenish-yellowish patina. There is a large cud right behind the head of George II. This cud is also found (although less pronounced) on another cast counterfeit in the Montclair hoard (see below).

33. 1975.117.13, 1729, 8.653 g, cast counterfeit of Seaby 3717

²⁷ Eric P. Newman, "American Circulation of English and Bungtown Halfpence," in Eric P. Newman and Richard G. Doty, *Studies on Money in Early America* (New York, 1976), p. 171.

²⁸ Weston, "Evasion Hybrids" (above, n. 3), pp. 1466-67.

This coin was also in the Beach-Grünthal collection, but it does not share the same patina as the other coins. It does have, however, the same cud as coin number 1975.117.14, but the treatment of Britannia shows that the two coins cannot come from the same mold. It is quite possible that the same coin with a cud may have served as the patrix for two different molds: the mold for 1975.117.13 and the mold for 1975.117.14.

34. 1975.117.15, 1749, 9.021 g, counterfeit of Seaby 3719

A counterfeit of a George II old bust British halfpenny. This is the heaviest coin in the hoard—and therefore the oldest counterfeit? The 1749 date is very significant; 726,800 halfpence, many dated 1749, were released into American circulation in 1750.²⁹ There were so many genuine 1749 halfpence in circulation in America that they were often used as patrices for making sand cast counterfeits. Because of this, we could assign this coin to America even without the hoard evidence, but the patination, which assigns it to the Beach-Grünthal hoard and therefore to an American origin, provides very useful confirmation. Eric P. Newman independently concluded that these two cast counterfeits were of American origin, before (at Eric P. Newman's suggestion) I examined the coins further and decided that they were all part of an American hoard.

NEW JERSEY COPPERS

(Goadsby and Cox, Rahway Mills, New Jersey)³⁰

35. 1945.42.661, 1786, 8.071 g, Maris 17–K, Breen 895

Greenish patina with reddish brown spots.

36. 1945.42.682, 1787, 9.036 g, Maris 31–L, Breen 906

Lovely green patina; some reddish brown spots. Heavy obverse die breaks.

²⁹ Eric P. Newman, "American Circulation of English and Bungtown Halfpence," in Eric P. Newman and Richard G. Doty, *Studies on Money in Early America* (New York, 1976), pp. 145–46.

³⁰ I have used *Breen's Encyclopedia* as a guide to the various New Jersey mints and have also looked at the catalogue descriptions by Michael Hodder in the Bowers and Merena auction of Henry Garrett's collection of New Jersey coppers.

37. 1945.42.682, 1787, 9.914 g, Maris 31-L, Breen 906

The coin has been cleaned, but traces of the patina remain. Heavy obverse die breaks.

38. 1945.42.699, 1787, 10.930 g, Maris 38-Z, Breen 910

Dark green patina. Small planchet clip at 11.50 on the obverse.

(Ogden and Rindell, Elizabeth Town)³¹

39. 1945.42.760, 1787, 5.738 g, Maris 73-aa, Breen 935

Many areas of reddish brown spots; double struck off center. The undertype is a counterfeit George III Irish halfpenny; the Irish undertype may be distinguished by the vertically combed hair of George III. The three visible letters correspond somewhat to a 1782 Irish counterfeit halfpenny in the ANS collection, but not enough of the undertype is visible to make a definite identification by dies.

³¹ This is Walter Breen's attribution. In the Bowers and Merena auction of the collection of Henry Garrett (March 1992), Michael Hodder ascribed this variety to an unknown mint.

GRECO-ROMAN ALCHEMY AND COINS OF IMITATION SILVER

(PLATES 28–32)

PAUL T. KEYSER

Despite numerous studies of the alloys of bronze coins and much work on the precious metal content of silver and gold coins by various modern methods, there has been little work done on ancient coins of imitation silver. There has been a long discussion of how the late Roman silver washed denarii and antoniniani were produced.¹ But despite occasional results showing that there were ancient coins of imitation silver produced long before the late Roman ones, both by plating and by alloying, this evidence has not previously been gathered together. In the course of a large study of over 500 silver coins from the fifth century B.C. to the fourth century A.D. a number of anomalous coins were detected which, on examination by an electron micro-probe, provided evidence of a variety of methods of producing imitation silver. Most of the alloys detected here, and gathered from previous work, are otherwise known only from alchemy.²

¹ The most recent work appeared after this article was in its present form: Susan La Niece, "Technology of Silver-Plated Coin Forgeries," *Metallurgy in Numismatics*, 4.3, ed. M. M. Archibald and M. R. Cowell (London, 1993), pp. 227–36, pl. 1–3. La Niece surveys various methods of silver plating which have been suggested by numismatists.

² F. S. Taylor, "Survey of Greek Alchemy," *JHS* 50 (1930), pp. 109–39; J. Lindsay, *The Origins of Alchemy in Greco-Roman Egypt* (New York, 1970); R.

The ancient alchemy began as an attempt to fit long known practices of materials technology (smelting and refining, e.g.) into the framework of hellenistic matter theory: the result was an emphasis on the production of "artificial" silver, gold, and electrum, already long desired, and now made reasonable by the theory.³ It has been hard to penetrate the allegory and jargon of the ancient texts, so that scholars have tended to assume that, like the later medieval alchemy, it was all smoke and mirrors. Although no one ever made silver or gold (only extracted them from unlikely looking rock), nevertheless there was a corpus of techniques for the imitation and adulteration of silver and gold. The properties of gold (inertness, density, color, malleability) are unusual and thus hard to imitate, so ancient alchemists far more often successfully imitated silver.

Coins provide a uniquely precise way of studying ancient alloys, giving a date and place of manufacture, since numismatic study can usually locate an ancient coin relatively precisely. The seventeen coins reported here are all ancient: six at least (3–6, 8 and 9) are hoard coins, and there is no evidence that any are modern forgeries. On the other hand, if they are ancient but unofficial mintings (counterfeits as in Pliny 33.46), then they must have been produced close in space and time to the coins being imitated. This is likely for five of these coins (1 and 2, 7, 10 and 11) and possible for three others (12, 14 and 15). Thus, the evidence suggests that at least from hellenistic times (i.e. at the very beginnings of alchemy) the use of imitation silver of one kind or another was widespread and continued down to late antiquity. Further systematic searches will reveal more such coins, both official and unofficial.

The coins studied were selected as silver coins and later identified as anomalous either based on appearance or on low specific gravity (SG) values. The SG tests were standard, except that instead of water, a pair of high density halocarbon liquids was used and the procedure

Patai, "Maria the Jewess: Founding Mother of Alchemy," *Ambix* 29 (1982), pp. 77–97 (of the first century B.C. or A.D.).

³ Paul T. Keyser, "Alchemy in the Ancient World: From Science to Magic," *Illinois Classical Studies* 15 (1990), pp. 353–78.

was slightly altered to enable high precision measurements.⁴ The advantages of this SG method are that it is simple—costs are low, the procedure is quick, and little special training is required—and that it is a nondestructive measure of bulk composition.⁵ The coins identified as anomalous were subjected to analysis by electron microprobe (a number showed no conclusive evidence of plating or anomalous alloy, and these will be reported in the larger study). Electron microprobe analysis was selected because it was available (without charge), rapid, and non-destructive. The analyses here reported were provided courtesy of John Drexler (Geology, Colorado) and Cameron Begg (Geology, Illinois) using normal procedure with an electron microprobe (at Colorado a JEOL Model 8600, and at Illinois a JEOL Model JSM-50AX, operating at 300 pA and 20 KeV). Clean spots on worn surfaces were targeted using an optical microscope. The output in each case consisted of relative abundances by weight of various elements, quantified by comparison with standard pure-metal spectra using a computer, and normalized to a total of 100 percent.

Before turning to a consideration of these results it is appropriate first to discuss the alchemical background (Table 1 summarizes the following discussion). The production of silver was from the beginning an empirical process which could not be explained and so would have seemed quasi-magical. The process of cupellation known by ca. 2000 B.C. causes the disappearance of most of the matter input: Galena (a lead sulfide mineral) is roasted to lead oxide which is then absorbed or

⁴ Because SG is relevant to these results only in so far as a low value served to identify the coin as anomalous, the details of the procedure are irrelevant. Various balances were used at the various museums, primarily Mettlers, but all had a sensitivity of ± 0.1 mg.

⁵ M. J. Hughes and W. A. Oddy, "A Reappraisal of the Specific Gravity Method for the Analysis of Gold Alloys," *Archaeometry* 12 (1970), pp. 1–11 (suggesting the use of the very expensive per-fluoro-1-methyl-decalin); W. A. Oddy, "The Analysis of Gold Coins—a Comparison of Results Obtained by Non-Destructive Methods," *Archaeometry* 14 (1972), pp. 109–17; and W. A. Oddy and S. M. Blackshaw, "The Accuracy of the Specific Gravity Method for the Analysis of Gold Alloys," *Archaeometry* 16 (1974), pp. 81–90.

vaporized leaving behind a few percent by weight of the original as a pure silver "button."⁶ Similarly perceived as magical was the process by which gold was purified, also known by ca. 2000 B.C. Impure gold was baked in a closed vessel with salt, sand or clay, and organic matter, resulting in pure gold with a layer of dross above.⁷ That brass (orichalc) could be produced to resemble gold was known by at least the fourth century B.C. (e.g., Theopompos fr. 109 G-H = Strabo 13.1.56, and Theophrastos, *De Lap.* 49).⁸

TABLE 1

Possible Ancient Methods of Silvering Base Flans

<i>Method</i>	<i>Coin</i>	<i>Reference</i>
1) White Bronze		
As-Cu alloy	3, 4, 5, 6	Bolos, <i>Phys. Myst.</i> 4
Sn-Cu alloy	11, 11	<i>P. Leid.</i> X, 13, 29, 39
2) Pickling		
Ag-Cu alloy	—	Bolos, <i>Phys. Myst.</i> 12, (? <i>P. Leid.</i> X, 19)

⁶ R. J. Forbes, *Studies in Ancient Technology* 8 (Leiden, 1971), pp. 196–266, remains authoritative (hereafter Forbes 8). Although known by ca. 2000 B.C., there is evidence that the process was far more heavily used after ca. 500 B.C.: Sungmin Hong, J.-P. Candelone, C. C. Patterson, and C. F. Boutron, "Greenland Ice Evidence of Hemispheric Lead Pollution Two Millennia Ago by Greek and Roman Civilizations," *Science* 265 (1994), pp. 1841–43 (a reference I owe to James Barrett).

⁷ A. Lucas, *Ancient Egyptian Materials and Industries*⁴, ed. J. R. Harris (London, 1962), pp. 224–35; Forbes 8, pp. 173–76, 180–81; J. H. F. Notton, "Ancient Egyptian Gold Refining: A Reproduction of Early Techniques," *Gold Bulletin* 7, 2 (1974), pp. 50–56, has experimentally confirmed the efficiency of the process; R. Halleux, "L'affinage de l'or, de Crésus aux premiers Alchimistes," *Janus (Rev. Int. Hist. Sci.)* (1975), pp. 80–102, prefers a date as late as ca. 700 B.C.

⁸ E. R. Caley, *Orichalcum and Related Ancient Alloys*, Numismatic Notes and Monographs 151 (New York, 1964), pp. 13–31, surveys the knowledge of brass before the first century B.C., but is often too skeptical. Jacoby, *FGrHist*, omits Strabo 13.1.56, but see B. P. Grenfell and A. S. Hunt, *Hellenica Oxyrhynca cum Theopompi et Cratippi Fragmentis* (Oxford, 1909), from *Phillipica* 13, fr. 109, as preserved in Steph., *Lex.*, s.v. Ἀνδραγα.

3) Tin Pewter with		
Pb	8, 9?; 14	<i>lex Cornelia de falsis</i>
Pb + Zn	—	<i>P. Leid.</i> X, 11
Ag	—	<i>P. Leid.</i> X, 3
Hg?	—	<i>P. Leid.</i> X, 5, 36, 84
Pure Sn	7	<i>P. Leid.</i> X, 23
4) Baked-on Coatings		
Sn-Pb	15	Pliny 34.160-1
Sn-Hg	—	Pliny 34.162-3, <i>P. Leid.</i> X, 26, 41
Ag-Pb	12-3, 16-7?	(? Pliny 24.162-3)
5) Fourré		(Campbell, 1933)
Ag foil soldered to flan	—	
Ag foil fused to flan	2	Hdt. 3.56, etc.
Ag filings fused to flan	12-3, 16-7?	
6) Cerargyrite (AgCl) Hot Dip	—	(Cope, 1972)
'Natural' pickling	—	(Cope, 1972)

About 200 B.C. Bolos of Mendes wrote *Physica et Mystica*, which contains among others a recipe for producing false silver from an arsenic-copper alloy (*Phys. Myst.* 20):⁹

περὶ ἀσήμου ποιήσεως· ὑδράργυρον, τὴν ἀπὸ τοῦ ἀρσενίκου, ἢ σανδαράχης, ἢ ὡς ἐπινοεῖς, πῆξον ὡς ἔθος, καὶ ἐπίβαλλε χαλκῷ <ἢ> σιδήρῳ θειωθέντι, καὶ λευκανθήσεται· τὸ δ' αὐτὸ ποιεῖ καὶ μαγνησία λευκανθεῖσα, καὶ ἀρσένικον ἐκστραφέν, καὶ καδμία ὀπτῇ, καὶ σανδαράχη ἄπυρος, καὶ πυρίτης λευκανθείς, καὶ ψιμόθιον ἅμα θειῷ ὀπτηθέν.

About the making of "uncoined": the quicksilver from arsenic, or sandarach, as you prefer, cook it as usual, and deposit it on copper or coppered iron, and it will be whitened. Whitened magnesia does the same thing, and transmuted arsenic, and cooked cadmia [ZnO?], and unfired sandarach, and whitened pyrite, and psimuthion [lead acetate] cooked with sulfur.

⁹ M. Berthelot, *Collection des Anciens Alchimistes Grecs* 2 (Paris, 1888; rpt. Osna-brück, 1967), pp. 49-50. I interpret σιδήρῳ θειωθέντι as iron plated with copper by immersion in χάλκανθον (Berthelot's "fer traité par le soufre," *CAAG* 3.53, is chemically impossible here). On ἄσημος see R. Halleux, "Le sens d'ἄσημος dans le papyrus chimique de Leyde et dans l'alchimie gréco-égyptienne," *Chronique d'Égypte* 48 (1973), pp. 370-80.

This is paralleled in a text of ca. A.D. 300, the "Leyden Papyrus X," whose recipe also calls for *σανδαράχη* = arsenic sulfide (*P. Leid. X* 22).¹⁰ A similar alloy was high-tin bronze (50% to over 80%: *P. Leid. X* 13, 29, 39), sometimes with added mercury or silver.¹¹

Besides such "white-copper" alloys, Bolos describes the "pickling" or leaching the base metal out of the surface of an alloyed object to "extend" the silver (*Phys. Myst.* 13):¹²

Χρυσοκόλλαν τὴν τῶν Μακε-
δόνων τὴν ἰῶ χαλκοῦ παρεμφέ-
ρουσαν οἰκονόμει λειῶν οὖρῳ
δαμάλεως ἕως ἐκστραφῇ· ἡ γὰρ
φύσις ἔσω κρύπτεται. Ἐὰν οὖν
ἐκστραφῇ, κατὰ βαπτον αὐτὴν εἰς
ἔλαιον κίκινον πολλάκις πυρῶν
καὶ βάπτων· εἶτα δὲ ὁπταῖσθαι
σὺν στυπτηρίᾳ προλειώσας μίσινι,
ἢ θείῳ ἀπύρῳ ποίει ξανθὸν καὶ
ἐπίβαπτε πᾶν σῶμα χρυσοῦ.

Treat the "chrysokolla" [red gold]
of the Macedonians, when coated
with verdigris, triturating with
urine of a heifer until it trans-
mutes: for its nature is hidden
within. If it transmutes, immerse
it in castor oil, burning and
dipping many times: then go and
cook it with styptic earth, first
triturating it with misy [copper
sulfate], or make it yellow with
unfired sulfur and gild the whole
golden mass.

The "Leyden Papyrus X" provides a parallel again (*P. Leid. X*, 14, 24, and 67 = 74) for pickling gold alloys at least and probably for silver as

¹⁰ Also at *P. Leid. X*, 83, C. Leemans, *Papyri Graeci Musei Antiquarii Lugduni-Balavorum* (Leyden, 1843 ff.). I follow the translation of E. R. Caley, "The Leyden Papyrus X: An English Translation with Brief Notes," *J. Chem. Ed.* 3 (1926), pp. 1149–66, and the text of Robert Halleux, *Les Alchimistes Grecs* 1 (Paris, 1981). The numbers which identify the recipes are slightly different: Halleux 22 = Caley 23; Halleux 83 = Caley 85. In the following notes I indicate this with a suffixed "H." or "C." respectively.

¹¹ 13 H. = 14 C.; 29 H. = 30 C.; and 39 H. = 40 C. The tin bronze with mercury appears at *P. Leid. X*, 12 (H. = 13 C) and with silver at *P. Leid. X*, 40 (H. = 41 C.); the recipes *P. Leid. X*, 5–10, 18–19, seem similar but less clear.

¹² Berthelot (above, n. 9), p. 46. Here the *χρυσοκόλλα* must be the Cu-Au alloy used as a hard solder for gold, rather than the malachite (or verdigris = *ἰός χαλκοῦ*) used in granulation to produce that alloy *in situ* on heating. The urine and oil serve as a deoxidizer and an anti-oxidant before the final cementation.

well (*P. Leid.* X, 19).¹³ Some sort of extension (either this pickling or the base silver alloys of *P. Leid.* X, 3, and *P. Holm.* 6–7, see below), or perhaps large residual lead, seems to be implied by the exactly contemporary report of Livy 32.2.1–2: ...*id (argentum) quia probum non esse quaestores renuntiauerant, experientibusque pars quarta decocta erat*: “because it (the silver) was not proper, the quaestors renounced it, for a fourth part of it was cooked away when they tried it” (199 B.C.). Did the quaestores use Archimedes’ newly found method of SG, or did they simply recupellate a few coins (*decocta*)?

Next in chronological order would be white-metal alloys such as in the *lex Cornelia de falsis* of 81 B.C. (*Digest* [Ulpian] 48.10.9), which penalizes the production of pewter (tin-lead alloy) as imitation silver.¹⁴ The “Leyden Papyrus X” contains the recipe for this as well (although the alchemist adds zinc: *P. Leid.* X, 11). Other versions seem to have been known, a tin-mercury alloy (*P. Leid.* X, 5, 36, 84) if not the same as the next method, and possibly even the use of pure tin (*P. Leid.* X, 23).¹⁵ Moreover, white-metal alloys which amount to “extended” silver were known: a ternary lead-copper-silver alloy (Demosth. 24 *Timokr.*, 214), a tin-silver alloy (*P. Leid.* X, 3), or an antimony-silver alloy (*P. Holm.*, 6–7).¹⁶ One Bactrian coin (an obol of Eukratides, ca. 170–135 B.C.) is known to be a zinc-silver alloy (25% Zn, 70% Ag).¹⁷

Vitruvius 7.8.4 refers to the gilding of silver and copper using *argentum uiuum* (mercury, see *P. Leid.* X 55), which is also confirmed

¹³ 14 H. = 15 C.; 19 H. = 20 C.; 24 H. = 25 C.; 67 H. = 69 C.; and 74 H. = 76 C. See L. Cope, “Surface-Silvered Ancient Coins,” *Methods of Chemical and Metallurgical Investigation of Ancient Coinage*, ed. E. T. Hall and D. M. Metcalf, RNS Special Publication 8 (1972), pp. 261–78, pls. xix–xx, at pp. 267–69.

¹⁴ P. Grierson, “The Roman Law of Counterfeiting,” *Essays in Roman Coinage Presented to H. Mattingly*, ed. R. A. G. Carson and C. H. V. Sutherland (Oxford, 1956; rpt. Aalen, 1979), pp. 240–61, at 242.

¹⁵ 36 H. = 37 C.; 84 H. = 86 C.; and 23 H. = 24 C.

¹⁶ O. Lagercrantz, *Papyrus Graecus Holmiensis, Recepte für Silber, Steine und Purpur* (Uppsala-Leipzig, 1913).

¹⁷ J. A. Buckley, “An Analysis of Thirty-one Coins from the Hellenistic Period,” *Archaeometry* 27 (1985), pp. 102–7, coin “Bac. 7.” Buckley used PIXE, and explained the Zn as a cupellation residue (p. 104), which is extremely unlikely as the Pb content is only 0.39% (or 0.5 % relative to the Ag) indicating efficient cupellation (and Zn vaporizes well below cupellation temperatures).

by Pliny 33.64–5, 100, and 125. Although silver amalgams can be made they do not work well being prone to crystallize, and the comparable ancient silvering method involves a tin amalgam (Pliny 34.162–63 and *P. Leid.* X, 26 and 41).¹⁸ For gilding there was also a lead-gold alloy (*P. Leid.* X, 37),¹⁹ while a lead-silver version would have worked well and may have been referred to by Pliny 34.162–63. Pliny 34.160–61 refers to various alloys of tin and lead alone with which objects are silvered. In these recipes the amalgam (or lead alloy) was applied to the object, which was then heated thus evaporating the mercury or lead and leaving the gold or silver coating behind. In the case of the tin-lead alloy there may not have been a subsequent heating.

Lead-cored coins are explicitly attested by Hdt. 3.56 (gold covering lead) and the Athenian coinage law of 375/4 B.C., *SEG* 26.72 (silver covering lead).²⁰ Moreover, Campbell has shown that silver foil of 0.1 to 0.2 mm (4 to 8 mils) thickness could be eutectically fused or soldered to the copper flan and then struck (such a coin is usually called *fourré*, “stuffed”). This was done in Greece and Southern Italy from ca. 460 B.C. to ca. 290 B.C. and in Rome ca. 140 B.C. to ca. A.D. 100, and probably in other areas as well.²¹ One of the last two

¹⁸ 55 H. = 57 C.; 26 H. = 27 C.; 41 H. = 42 C. On early mercury gilding, see P. Lins and W. A. Oddy, “The Origins of Mercury Gilding,” *Journal of Archaeological Science* 2 (1975), pp. 363–73. The find with the earliest archaeological evidence is late Chou (third century B.C.) China. It is rare in the Mediterranean world before the third century A.D. See R. Halleux, “De Stagnum « étang » à Stagnum « étain »: Contribution à l'Histoire de l'Étamage et de l'Argenture,” *Antiquité Classique* 46 (1977), pp. 557–70; and Aimé Thouvenin, “L'étamage des objets de cuivre et bronze chez les anciens,” *Revue de l'Histoire des Mines et de Métallurgie* 2 (1970), pp. 101–9.

¹⁹ 37 H. = 38 C.

²⁰ R. Stroud, “An Athenian Law on Silver Coinage,” *Hesperia* 43 (1974), pp. 157–88, see line 11. I am indebted to John M. Mansfield of the Greek Epigraphy Project (Cornell) for locating the *SEG* reference for me.

²¹ W. Campbell, *Greek and Roman Plated Coins*, Numismatic Notes and Monographs 57 (New York, 1933), pp. 144 and 174 (before striking, p. 157). Three slightly different methods may have been used: a) silver foil soldered to the copper flan with the eutectic solder (72% Ag, 28% Cu); b) silver foil fused to the copper flan; or c) silver powder in a flux painted on the copper flan. In all cases the plating is done by heating to the eutectic point (780° C, the melting point [MP] of the

(baked-on coating or fourré) is probably to what Aristophanes, *Ranae*, ll. 718–26, is referring when he speaks of adulterated (κεκιβδηλευμένοις) coins which are bad coppery ones (πονηροῖς χαλκίοις).²²

A modern suggestion which cannot be refuted but seems very unlikely to me is cerargyrite (AgCl, MP = 455°C), either the natural horn-silver mineral or the purified dross from refining gold by cementation. It may have been used as a hot dip for the copper flans (direct chemical exchange of the copper and silver would coat the flan with a layer of silver a few microns thick).²³ I know of no other hot dip at such an elevated temperature in antiquity.

TABLE 2

Coin Identification	SG	Metallic Composition (% by weight)					
1 Colorado 18	6.933	Sn 60.4	Sb 37.6	Cu 1.8	Hg 0.33	As 0.30	+
	± 0.004	± 3.6	± 2.3	± 0.1	± 0.02	± 0.02	
Tetrobol, Philip II (348 ± 12 B.C.), rev. horse with rider prancing r., see <i>McLean</i> 3357, 9; ^a <i>SNGAsh</i> 2507–10. ^b							

^a *McClean*, S. W. Grose, *Catalogue of the McClean Collection of Greek Coins*, vol. 2 (1979).

^b *SNG*, *Sylloge Nummorum Graecorum*; *SNGAsh*, *SNG [Great Britain] 5*; *Ashmolean Museum* (1979).

lowest melting-point alloy). M. H. Crawford, "Plated Coins, False Coins," *NC* 148 (1968), pp. 55–59, and *RRC*, vol. 1, pp. 560–65, argues convincingly that in Republican Rome at least all plated coins were ancient contemporaneous forgeries. Campbell microscopically examined the 16 coins in Tables 3A and 3B, after sawing them in half or cutting a wedge into them, and polishing the cut surface. He visually examined but did not analyze 21 more coins which conformed to the above findings, and for which he paradoxically provided good photos.

²² Possibly also a pun at line 730: χαλκοῖς ... πυρροῖς = "redheads" and "coppery." The *Schol. Aristoph. ad Ranas*, line 725, states ἐπὶ γὰρ Καλλίου [i.e., 406/5 B.C.] χαλκοῦν νόμισμα ἐκόπη—this is not token coinage but silver-clad bronze. See B. B. Rogers, *The Frogs of Aristophanes*² (London 1919), pp. 108–11; E. S. G. Robinson, "Some Problems in the Later Fifth Century Coinage of Athens," *ANSMN* 9 (1960), pp. 1–15, at 10–11, pls. 1 and 2; and J. H. Kroll, "Aristophanes' πονηρὰ χαλκία: A Reply," *GRBS* 17 (1976), pp. 329–41.

²³ See Cope (above, n. 13), pp. 275–76, for the suggestion. Pliny 33.84–85 does record that this dross was used medicinally and may mean to indicate that silver was refined from it, 33.69. At any rate he knows that native gold contains always some silver, 33.80.

- 2 Colorado 23 10.25 Ext.: Ag 100 (no others detected)
 ± 0.04 Int.: Pb 94.4 Ag 5.25
 $\pm 5.7 \pm 0.32$
 Drachm, Alexander (329 \pm 6 B.C.), see *SNGAsh* 2727–53; *SNGBerry* 232–42 (? Colophon).^c
- 3 Carr-LaN 7.3 — Ext.: Cu 73.9 As 20.1 Svb 2.0 Sn 1.9 Pb 1.9
 $\pm 4.4 \pm 1.2 \pm 0.1 \pm 0.1 \pm 0.1$
 Int.: Cu 87.9 As 8.8 Pb 2.1 Sn 0.7 Sb 0.4
 $\pm 5.3 \pm 0.5 \pm 0.1$
 Shekel, Libyan War (241–238 B.C.), Tanit; *rev.* plow, see *SNGCopNAfrica* 233–34.^d
- 4 Carr-LaN 7.6 — Ext.: Cu 71.9 As 18.8 Sb 3.2 Sn 3.0 Pb 2.8
 $\pm 4.3 \pm 1.1 \pm 0.2 \pm 0.2 \pm 0.2$
 Int.: Cu 88.5 As 7.3 Pb 2.0 Sn 1.0 Sb 0.9
 $\pm 5.3 \pm 0.4 \pm 0.1 \pm 0.1 \pm 0.1$
 Shekel, Libyan War (241–238 B.C.), Tanit, *rev.* plow, as 3.
- 5 Carr-LaN 9.34 — Ext.: Cu 71.3 As 22.9 Pb 3.3 Sn 1.8 Sb 0.4
 $\pm 4.3 \pm 1.4 \pm 0.2 \pm 0.1$
 Int.: Cu 84.4 As 12.2 Pb 2.2 Sn 0.9 Sb 0.2
 $\pm 5.1 \pm 0.7 \pm 0.1 \pm 0.1$
 Shekel, Libyan War (241–238 B.C.), Tanit, *rev.* plow, as 3.
- 6 Carr-LaN 9.35 — Ext.: Cu 71.5 As 14.5 Pb 7.0 Sn 6.3 Sb 0.3
 $\pm 4.3 \pm 0.9 \pm 0.4; \pm 0.4$
 Int.: Cu 81.4 Pb 9.0 As 5.7 Sn 3.7
 $\pm 4.9 \pm 0.5 \pm 0.3 \pm 0.2$
 Shekel, Libyan War (241–238 B.C.), Isis, *rev.* three grain ears, see *SNGCopNAfrica* 228 (perhaps 226–27, 229–32 also).
- 7 Illinois C-361 7.43 Sn 100 (no others detected)
 $\pm 0.01^*$
 Tetradrachm, Nikomedes II of Bithynia ($H\Xi P = 168$ B.E. = 129 B.C.), *rev.* draped Zeus standing, staff, see *SNG* 1.3, 4;^e
BMCBithynia 3 (128 B.C.);^f *Hunter* 6 and 8 (117 and 118 B.C.), same monogram.^g
- 8 Illinois C-578 10.35 PB 91.8 Sb 8.2
 $\pm 0.02 \pm 5.5 \pm 0.5$

^c *SNGBerry*, *SNGANS*, *The Burton Y. Berry Collection*, vol. 2 (New York, 1962).

^d *SNGCop*; *SNG*, *The Royal Collection of Coins and Medals*, Danish National Museum (Copenhagen, 1969)

^e *SNG*

^f *BMC*, *Catalogue of Greek Coins [British Museum]*.

^g *Hunter*, G. Macdonald, *Catalogue of Greek Coins in the Hunterian Collection*, vol. 2 (Glasgow, 1901).

Tetradrachm, Tiraos II of Characene ($BM\Sigma = 242$ S.E. = 71/0 B.C.), *rev.* Herakles seated on rock, l., club, $\text{Β} \text{Ι} \text{Α} \text{Σ} \text{Ι} \text{Λ} \text{Ε} \text{Ω} [\Sigma \text{ ΤΙΡΑΙΟΥ}] \Sigma \text{Ω} \text{ΤΗΡΟΣ} \text{ ΚΑΙ} \text{ΕΥΕΡΓΕΤΟΥ}$, see *BMCPersia* 1;^h Le Rider, pl. XX, 12.

9	Illinois C-650	10.42	Pb 96.3	Sb 3.7
		± 0.01	± 5.8	± 0.2

Tetradrachm, Tiraos II of Characene ($BM\Sigma = 242$ S.E. = 71/0 B.C.), as 8.

10	Colorado 323	7.774	Cu 66.3	Sn 30.2	Pb 1.33	Si 1.28	+
		± 0.002	± 4.0	± 1.8	± 0.08	± 0.08	

Denarius, **DIVA FAVSTINA** (A.D. 150 \pm 12), *rev.* **AVGVSTA**, Ceres (?) standing l., see *RIC* 3, 362 (reading of reverse doubtful).^h

11	Illinois G-119	8.67	Cu 58.6	Sn 36.9	Zn 2.8	Fe 1.00	+
		$\pm 0.02^*$	± 3.5	± 2.2	± 0.2	± 0.06	

Denarius, **SEVERVS PIVS AVG** (A.D. 210), *rev.* Neptune standing l., **P M TR P XVIII COS III PP**. See *RIC* 4, 1 234.

12	Illinois G-201	7.530	Ext.: Ag 100. (Pb, Sn also reported)
		± 0.002	Int.: Cu 98.2 Sn 1.6 Ag 0.2
			$\pm 6.0 \pm 0.1$

Antoninianus, **IMP CAE C VIB VOLVSIANO AVG** (A.D. 252 \pm 1), *rev.* **VIRTVS AVGG**, Virtus standing l., shield and spear, see *RIC* 4, 3 187; *Glasgow* 3, 14-15 (Rome mint).ⁱ

13	Illinois G-215	8.35	Ext.: Ag 76.0	Cu 17.9	Sn 3.3	Pb 2.8
		$\pm 0.02^*$	± 4.6	± 1.1	± 0.2	± 0.2
			Int.: Cu 94.7	Sn 3.0	Ag 2.3	
			± 5.7	± 0.2	± 0.1	

Antoninianus, radiate draped bust r., **IMP C P LIC VALERIANVS P F AVG** (A.D. 257 \pm 3), *rev.* **RESTITVT ORIENTIS**, turreted female standing r., presenting wreath to Valerian standing l., see *RIC* 5, 1, 286 (Antioch mint), *Glasgow* 4, 75.

14	Colorado 360	7.890	Sn 52.2	Pb 37.1	Cu 8.45	Sb 0.9	+
		± 0.005	± 3.1	± 2.2	± 0.51	± 0.1	

Antoninianus, **GALLIENVS AVG** (A.D. 264 \pm 4), radiate cuirassed bust r., *rev.* **IOVI VLTORI**, Jupiter standing scepter and fulmen, see *RIC* 5, 1, 221 F (Rome mint), *Glasgow* 4, 12-13.

15	Illinois G-223	8.01	Ext.: Cu 51.7	Sn 21.9	Pb 21.5	P 4.8
		± 0.02	± 3.1	± 1.3	± 1.3	± 0.3
			Int.: Cu 90.2	Sn 8.9	Pb 0.69	P 0.22
			± 5.4	± 0.5	± 0.04	± 0.01

Antoninianus, **GALLIENVS AVG** (A.D. 264 \pm 4), *rev.*; **LIBERO P CONS AVG**, panther walking l., see *RIC* 5, 1, 230 F (Rome mint), *Glasgow* 4, 112-17.

^h *RIC*, H. Mattingly, E. A. Sydenham et al., *Roman Imperial Coinage* (1923-).

ⁱ *Glasgow*, Anne S. Robertson, *Roman Imperial Coins in the Hunter Coin Cabinet, University of Glasgow* (1962-82).

16	ANA 1981.195.73	8.348 $\pm 0.006^*$	Ext.:	Ag 71.0	Cu 26.0	Pb 3.0	
				± 4.3	± 1.6	± 0.2	
			Int.:	Cu 92.2	Sn 4.2	Ag 3.3	Pb 0.3
				± 5.5	± 0.3	± 0.2	
Antoninianus, GALLIENVS AVG (A.D. 264 \pm 4), radiate head, r., rev. AETERNITAS AVG, Sol standing l., raising r. hand, holding globe in l., see <i>RIC</i> 5, 1, 466 K (Milan mint).							
17	Illinois G-233	8.92 ± 0.02	Ext.:	Ag 76.0	Cu 17.9	Sn 3.3	Pb 2.8
				± 4.6	± 1.1	± 0.2	± 0.2
			Int.:	Cu 94.7	Sn 3.0	Ag 2.3	
				± 5.7	± 0.2	± 0.1	
Antoninianus, GALLIENVS AVG (A.D. 264 \pm 4), rev. SOLI INVICTO; as 16, in ex. PXXV, see <i>RIC</i> 5, 1, 611 A (Asia Mint), <i>Glasgow</i> 4, 201.							

Included in Table 2 are 13 coins from my own work, plus four more coins from the Libyan hoard published by Carradice and La Niece containing highly-arsenical copper coins. They did not determine specific gravity. Their analyses were made by the similar technique of X-Ray Fluorescence (using a Link Systems model 290), facilitating comparison with my results.²⁴ The uncertainties on the SGs are statistical, or, in the four cases labelled *, are assigned to single measurements, based on worst-case (largest) uncertainties obtained with similar coins. The SDs on the compositions are formal, that is a relative SD of 6% is assigned based on the recommendations of the operators at Colorado and Illinois.²⁵ Carradice and La Niece fail to give uncertainties, so I have arbitrarily adopted the same relative SD. Elements are listed in decreasing order of abundance. Trace elements of less than 0.1% are not reported. The + at the end of the list of elements indicates further elements were detected at more than 0.1% (but less than any listed: coins 1, 10, 11, 14). I include the four high-arsenic coins from Carradice and La Niece for which they provided photos. A fifth coin (also a Tanit-plow issue) was similar, with even

²⁴ Ian A. Carradice and S. La Niece, "The Libyan War and Coinage: A New Hoard and the Evidence of Metal Analysis," *NC* 148 (1988), pp. 33-52, pl. 7-12; see pp. 41-43 for their XRF analysis.

²⁵ When this would formally result in a total of > 100%, as 2, with $94.4 \pm 5.7\%$ Cu, one can either assume renormalization, or reduce the assigned uncertainty proportionately (as I do below when propagating SDs to SGs from compositions).

more arsenic:²⁶ exterior = $66.2 \pm 4.0\%$ Cu, $28.6 \pm 1.7\%$ As, $4.0 \pm 0.2\%$ Sb; interior = $87.1 \pm 5.2\%$ Cu, $11.6 \pm 0.7\%$ As, 0.5% Sb.

The numbers "Carr-LaN" for these coins are their plate numbers in Carradice and La Niece.²⁷ The number assigned to the Colorado coins is that of the published catalogue by the Wallaces.²⁸ The numbers "Illinois G-" are from the published catalogue of the Roman coins by Groves,²⁹ while the number "Illinois C-" are the inventory numbers of the unpublished Greek coins. The "ANA" number (coin 16) is the American Numismatic Association accession number. Tables 3A and 3B report the analyses by Campbell of Greek and Roman fourré coins.

I make use in the following of the Menelaus equation for the expected specific gravity ρ of an alloy composed of fractions α_i of metals of specific gravity ρ_i each:³⁰

$$(1) \quad \Sigma \alpha_i = 1 \text{ and } \Sigma (\alpha_i / \rho_i) = 1 / \rho$$

Alloys of metals which form intermetallic compounds or solid solutions will deviate somewhat from the values predicted by this equation, but not greatly. The comparison of an expected SG value based on the composition determined by microprobe with the measured SG serves as a check on the analysis of composition. See Table 4 for a list of the SGs used.

²⁶ Carradice and La Niece (above, n. 24), p. 40, table 1, 6 (hoard coin 14).

²⁷ In fact Carradice and La Niece 7.3 = hoard coin 4; Carr-LaN 7.6 = hoard coin 8; Carr-LaN 9.34 = BM 1930-4-27-9 (from Tunis 1928 hoard, *IGCH* 2281); and Carr-LaN 9.35 = BM 1961-4-4-1.

²⁸ Wm. and Mary Wallace, "Catalogue of the Greek and Roman Coins at the University of Colorado," *U. of Colorado Studies* 25 (1938), pp. 237-79.

²⁹ Thos. D. Groves, "The Roman Imperial and Byzantine Gold and Silver Coins in the World Heritage Museum of the University of Illinois, Urbana" (master's thesis 1978).

³⁰ See Joseph Wüschmidt, "Die Schrift des Menelaus über die Bestimmung der Zusammensetzung von Legierungen," *Philologus* 80 (1925), pp. 377-409. For date see Ptolemy *Synt.* 7.3.

ANALYSIS OF COINS

TABLE 3A

Greek Fourré Coins Investigated by Campbell

<i>Date B.C.</i>	<i>Campbell No.</i>	<i>Method</i>	<i>Coin Description</i>
456 ± 45	11	fused powder	Stater of Neapolis, Macedonia; gorgoneion; <i>rev.</i> quartered mill-sail incuse square, see <i>Hunter</i> 2 (plated); <i>McLean</i> 3074-75; <i>SNGAsh</i> 2320.
ca. 420	5	foil	Stater of Croton, Bruttium; eagle l.; <i>rev.</i> tripod, KPO down l., see <i>McLean</i> 1704; <i>SNGAsh</i> 1517.
ca. 407	38 (pl. 184, <i>rev.</i> only)	fused powder	Athens owl, drachm, see <i>Hunter</i> 32, 33; <i>McLean</i> 5824.
370 ± 30	4	fused foil	Didrachm of Naples, Campania; female head r., behind head E; <i>rev.</i> manheaded bull full-face r., Nike flying above r. crowning bull, below, in exergue ΝΕΩΠΟΛΙΩΝ [sic Campbell, for -ΙΤΗΣ?], see <i>Hunter</i> 4, 5 (plated); <i>McLean</i> 236; <i>SNGAsh</i> 89.
362 ± 18	6	soldered foil	Stater of Tarentum, Calabria; horseman with target riding l.; <i>rev.</i> Taras astride dolphin l., see <i>McLean</i> 582; <i>SNGAsh</i> 264-65.
358 ± 20	7 (no photo)	? fused foil	Stater of Thebes; shield and amphora.
323-20	35 (pl. 161)	fused foil	Alexander (Babylon) tetradrachm; <i>rev.</i> in field M, below throne AY.
304 ± 36	34 (pl. 147)	soldered foil	Didrachm of Naples, Campania; head of nymph, r., behind, cornucopia; <i>rev.</i> as above; in exergue ΝΕΩΠΟΛΙΩΝ [sic], beneath bull Γ or Π, see <i>McLean</i> 266.
290 ± 22	9	soldered foil	Didrachm of Suessa, Campania; head of Apollo, r.; <i>rev.</i> mounted horseman bearing filleted palm, leading second horse, ΣΥΕΣΑΝΟ below, see <i>Hunter</i> 1, 2; <i>McLean</i> 380-82; <i>SNG</i> 4.1, 211-13; <i>SNGAsh</i> 177-79.

TABLE 3B

Roman Fourré Coins (Denarii) Investigated by Campbell

<i>Date.</i>	<i>Campbell No.</i>	<i>Method</i>	<i>Coin Description</i>
122 B.C.	10 (no photo)	fused foil	M. Parpirius Carbo; helmeted head of Roma, r.; <i>rev.</i> Jupiter in quadriga r., below M CARBO, see <i>BMCRR</i> 472, ^a <i>RRC</i> 276. ^b
113/2 B.C.	8	fused powder	L. Manlius Torquatus; Roma rt.; <i>rev.</i> horseman with spear, l., below L-TOR-QUA, behind. Q; see <i>BMCRR</i> 518-21; <i>RRC</i> 295.
103 B.C.	2	fused powder	Q. Minucius Thermus M. f.; <i>rev.</i> helmeted head of Mars, l.; two warriors with sword and shield, in exergue Q-TERM; see <i>BMCRR</i> 653-56; <i>RRC</i> 319.
76 B.C.	1	soldered foil	L. Lucretius Trio; head of Neptune, r.; <i>rev.</i> Genius on bridled dolphin r., below L LYCRETI TRIO, see <i>BMCRR</i> 3247-70; <i>RRC</i> 390/2.
46 B.C.	36 (pl. 170)	foil	T. Carisius; head of Iuno Moneta, r.; <i>rev.</i> coiner's apparatus, above T-CARISIVS; see <i>BMCRR</i> 4056; <i>RRC</i> 464/2
A.D. 26-37	37 (pl. 177-78)	fused foil	TI CAESAR DIVI AVG F AVGVSTVS, laureate hd., r.; <i>rev.</i> Livia seated r., PONTIF MAXIM, Lugdunum mint; see <i>BMCRR</i> 48-60.
A.D. 88/9	3	fused foil	IMP CAES DO]MIT AVG GERM PM T[R P..], <i>rev.</i> Minerva with spear attacking r., ...] CENS PPP, Rome mint; see <i>BMCRR</i> 147, 151.

^a *BMCRR*, H. A. Grueber, *Coins of the Roman Republic in the British Museum* (London, 1970).

^b *RRC*, Michael H. Crawford, *Roman Republican Coinage* (1974)

TABLE 4

Values of the SG of Elements in Coins

Gold, Au	19.0 to 19.3
Silver, Ag	10.5
Copper, Cu	8.93
<i>Secondary:</i>	
Antimony, Sb	6.68
Arsenic, As	5.72
Iron, Fe	7.87
Lead, Pb	11.3
Mercury, Hg	13.5
Phosphorous, P	2.20
Silicon, Si	2.33
Tin, Sn	7.30
Zinc, Zn	7.13

1. The coin is not otherwise anomalous, and the presence of numerous trace elements is consistent with ancient manufacture (Plate 28, 1). The expected SG is 7.08 ± 0.30 , consistent with the observed 6.933 to within the SD of 0.30 (determined from the SD in the composition).³¹ Although not specifically noted this is clearly a variant of the tinpewter silvers (Table 1, 3). Antimony "metal" as well as the ore stibnite (Sb_2S_3) were often confused with the lead-tin complex.³² Antimony was isolated in antiquity (probably by a process similar to extracting lead from galena) from ca. 2000 B.C.³³ Dioskorides,

³¹ Neglecting trace elements and propagating the uncertainties on the composition in the normal way, as is done generally herein.

³² R. J. Forbes, *Studies in Ancient Technology* 9 (Leiden, 1972), pp. 171–77. As he notes, strictly antimony is a semi-metal, or as he says, "metalloid."

³³ First by R. Virchow, "Neue Erwerbungen aus Transkaukasien, insbesondere eine Fenterurne und Schmücksachen aus Antimon," *Verh Berl Gesell Anthropol Ethnol Urgesch* (1884), pp. 125–31; and M. P. E. Berthelot, "Sur quelques métaux et minéraux provenant de l'antique Chaldée," *Ann Chim Phys* (6) 12 (1887), pp. 129–40. Recently, I. R. Selimkhanov, "Sur l'étude du fragment de vase de Tello appartenant au Musée du Louvre et le problème de l'utilisation de l'antimoine dans l'antiquité," *Laboratoire de Recherche des Musées de France, Annales* (1975), pp. 45–52, has analyzed the Tello vase and various artifacts from the Caucasus (using UV emission spectroscopy and AA analysis) and found 96 to 99% Sb.

Materia medica 5.84 and Pliny 33.101–4 record the preparation and use of stibnite in medicine. Although the normal Greek for antimony and its ore stibnite is *στίμμι*, it is just possible that the *στιλβάς* of *P. Holm.* 6–7 (recipes for “extending” silver) is antimony.³⁴ Other than the probably accidental use of antimony in bronze, this is the earliest antimony alloy.³⁵

2. The coin must have been produced by fusing a silver sheath to the “lead” core and striking the flan. The fusion would have occurred at a low temperature (not more than 300°C as lead melts at 327°C). Prior to striking and while still hot from the fusion, the flan may have been hardened by quenching. The SG is lower than expected for a coin composed of Pb and Ag, and applying the Menelaus equation gives an SG of 11.25 ± 0.32 .³⁶ The core is visibly porous which probably explains the discrepancy. The purity of the silver sheath may be due to very careful refining—99.7% pure silver is claimed for antiquity, though typical is perhaps 98.5%.³⁷ The Ag-Pb alloy core points to the use of raw (i.e. not desilvered) lead, or to a deliberate “extension” of silver by the addition of much lead. The migration of some silver into the core during the fusing process is possible, but several sites in the core (see Plate 28, 2) were examined and the alloy did not appreciably vary. The sheath is visibly “thick” but it was not possible to obtain a measurement. This coin is a variant of the fourré type (Table 1, 5).

3, 4, 5, and 6. These are discussed together as they were all produced by the same method (Plates 28, 3, and 29, 4–6). For 3, 4, and 5 there can be no question that they are ancient products as the

³⁴ See LSJ, s.v. Forbes (above, n. 32), p. 177, claims that the alchemists describe *στίμμι* as *μόλυβδος* and that Olympiodoros makes a lead-antimony alloy, but gives no references. For Olympiodoros, perhaps *ad Artem Zosimi* 40 (Berthelot [above, n. 9], 2.94) quoting Bolos (“Demokritos”): ἀπὸ στίμμεως καὶ λιθαργύρου κατάσπα μόλυβδον.

³⁵ Forbes (above, n. 32), pp. 174–75 and R. F. Tylecote, *A History of Metallurgy* (London, 1976), pp. 8–9.

³⁶ Here I use one-half the stated SD on the composition, since the percentage of Pb is close to 100 and its formal SD is greater than the percentage of Ag.

³⁷ Forbes 8, pp. 240–46; R. F. Tylecote, *The Early History of Metallurgy in Europe* (London, 1987), pp. 139–40.

coins came from hoards. The surface enrichment here is probably due to the normal "inverse casting segregation" of As-rich Cu alloys, which involves the "sweating out" of the 21.5% As eutectic (note that the surface layers of coins 3, 4 and 5 have an average As content of $20.6 \pm 1.7\%$).³⁸ In addition it is known that from ca. 2000 B.C. copper and bronze were coated with arsenic by a diffusion process. This occurs when the object is baked in a closed vessel with organic material and sandarach (As_2S_3) or roasted sandarach (As_2O_3).³⁹ The As content of the core and surface in at least one of these prehistoric items is very similar to these coins: 29% As surface, and 7% As core. Cu with 28.2% As forms an intermetallic compound Cu_3As , in equilibrium with the Cu-rich phase at 300 to 685°C, consistent with a diffusion process. The coin noted above with $28.6 \pm 1.7\%$ As was probably produced by this method. Thus I suggest the flans here were cast from an As-bronze (perhaps 9 to 10%), according to the recipe in Bolos, with some inverse segregation on casting, and some were then baked in a closed container with (burnt) sandarach and organic matter to lay on further As. Such a process could have been carried out on a large scale. The coins are a variant of pickled white bronze (Table 1, 1 and 2). If the surface layer is thin enough to be neglected, the approximate SG may be calculated as 8.47 ± 0.30 (significantly lower than Ag).⁴⁰

³⁸ H. McKerrell and R. F. Tylecote, "The Working of Copper-Arsenic Alloys," *Proc Prehist Soc* 38 (1972), pp. 209–18, at 212–13; Carradice-La Niece 45; Susan La Niece and Ian Carradice, "White Copper: The Arsenical Coinage of the Libyan Revolt 241–238 BC," *Journal of the Historical Metallurgy Society* 23 (1989), pp. 9–15. In essence when an As-Cu alloy is heated in a furnace under reducing conditions for a few hours, the As migrates to the surface to form the eutectic. Such migration can occur when, as here, the alloy has a long freezing range (rather than the freezing point of pure metals) and contracts on freezing (some alloys expand on freezing, as water does).

³⁹ Cyril S. Smith, "An Examination of the Arsenic-Rich Coating on a Bronze Bull from Horoztepe," *Application of Science in Examination of Works of Art*, ed. W. J. Young (Boston, 1973), pp. 96–102; J. Briard and J.-P. Mohen, "Le tumulus de la forêt de Carnoët à Quimperle," *Antiquités Nationales* 6 (1974), pp. 46–60.

⁴⁰ Using a nominal average composition of $87 \pm 2\%$ Cu, $10 \pm 2\%$ As, 2% Pb, and 1% Sn (determined from coins 3, 4, and 5, plus the "extra" coin listed in the text).

7. The coin (Plate 30, 7) is tin pewter as in *P. Leid X*, 23 (Table 1, 3). The purity of the tin is not odd as smelting cassiterite can yield almost pure tin. The main impurities in Cornish and Sardinian cassiterite are various oxides, in Portuguese cassiterite ore they are iron and tungsten, and in the recently discovered Anatolian cassiterite the main impurities are iron plus silica and calcite—all of these can be almost completely removed and purities of 99.5% can be achieved by methods known in the Bronze Age.⁴¹ In fact, the measured SG (7.43) is a little high for pure tin (SG = 7.30), which suggests the core may contain ca. 5% Pb.⁴² If so, the lead would have leached out of the surface through a natural “pickling” process during burial (the coin is visibly highly pitted). Evidently the Bithynian moneyer was unaware of Archimedes’ century-old discovery (or counted on widespread ignorance).

8 and 9. The two are nearly identical (die duplicates?), and bear an image of Tiraïos II, who is the king mentioned by Lucian, *Macrob.* 16 (Plate 30, 8 and 9). The coinage of Characene has not attracted much attention but the authoritative study does list “lead” as the material of many Characenian coins,⁴³ while the *BMC* merely notes “base” (the one analysis given is of a billon coin). Another study confirms these results—six Characenian coins (four dated the same year as the two here) were examined by XRF and contained lead along with $15.8 \pm 1.6\%$ Sb and $2.2 \pm 1.0\%$ Cu, and the one measured SG was 10.37 (of the same year as the coins here).⁴⁴ The calculated SGs here are a bit

⁴¹ Tylecote (above, n. 35), pp. 140–43. For the Anatolian cassiterite, see K. Aslihan Yener and Pamela B. Vandiver, “Tin Processing at Göltepe, an Early Bronze Age Site in Anatolia,” *AJA* 97 (1993), pp. 207–38, at 234.

⁴² The sensitivity of the SG determination, even with water, is more than sufficient to establish the deviation as significant. The question is the cause of that deviation.

⁴³ G. Le Rider, “Monnaies de Characène,” *Syria* 36 (1959), pp. 229–53, pls. 19–22, at pp. 243–47 for these types. Die linked to the lead issues are issues in silver. Le Rider believes the lead issues are modern fakes.

⁴⁴ Composition given is the average of five coins; the sixth was 2.5% Sb, 3.0% Cu (dated ΓΞΣ = 50/49 B.C.). The composition of the coin for which SG was determined = 85.7% Pb, 13.1% Sb, 1.1% Cu, from which the SG can be calculated to be 10.34. See H. H. Kricheldorf and W. Käß, “Blei-Tetradrachmen Tiraïos’ II Soter Euergetes aus der Charakene,” *Münzen- und Medaillen-Sammler, Berichte* 8 (1968), pp. 445–57.

higher than the observed (10.70 ± 0.42 compared to 10.35, and 11.00 ± 0.45 compared to 10.42) suggesting perhaps that the interior is slightly higher in Sb, or contains some Cu as in the other examples. The addition of Sb or Cu to lead would have two beneficial effects — the lead would be hardened (and if the flan were annealed and quenched it would be hardened still further), and the SG of the alloy would closely match that of silver. Tiraïos II did issue tetradrachms in silver.⁴⁵ These two coins are an unexpected variation of pewter, with antimony for the tin (Table 1, 3).

10 and 11. The two denarii though minted 60 years apart were produced by nearly identical methods (Plates 30, 10, and 31, 11). They are both white bronze coins (Table 1, 1) with high Sn content. The SGs are consistent with the composition, within the uncertainties. For 10 the Menelaus equation gives 8.38 ± 0.36 , compared to 7.77 observed, and for 11 we have 8.19 ± 0.33 , compared to 8.67 observed, in both cases more than one but less than two SDs out. Coin 10 is very corroded, which may explain the observed low SG, while coin 11 is in fine condition and the surface may contain remnants of Sn plate so giving a composition of lower SG than the bulk. The numerous trace elements are consistent with the production of this white bronze by co-smelting copper and tin ores.

12 and 13. These two antoniniani were produced by similar methods (Plate 31, 12 and 13). For 12, the surface condition did not allow the microprobe operator to find a clean spot on which to obtain a good measure of Pb and Sn content, but the CRT trace clearly showed Pb and Sn peaks. In both cases the interior is effectively a lead-free (<0.1%) ordinary low-tin bronze. I would argue that these are coins plated with silver using a Ag-Pb alloy (Table 1, 4). The lead was mostly removed from the flan by subsequent treatment, perhaps oxidation and absorption in bone ash as for ordinary cupellation. Such a process would not be at all difficult to carry out on a large scale (as the As-bronzes above, coins 3 to 6), perhaps even offi-

⁴⁵ BMC 1, pl. 43, 2, of 20 years later: *The Arthur S. Dewing Collection of Greek Coins*, ACNAC 6 (1985) by Leo Mildenberg and Sylvia Hurter, 2706, of 17 years later; and Le Rider (above, n. 43), pls. 20–22 (numerous coins) dating from 78/7 to 48/7 B.C.

cially. Alternatively Ag with a few percent Pb content could have been filed, sprinkled, or pasted onto the bronze flans, and then baked as suggested by Campbell. Only microscopic examination could detect which, but the coins do resemble Campbell's coins produced in this way.⁴⁶ Campbell performed no chemical analyses, so we cannot tell if his silver coatings contained lead. Comparing Table 3B, the Roman coins produced by this method are from the early first century B.C. The low SGs here suggest porosity (or possibly an undetected, high Sn content).

14. This is a Sn-Pb pewter antoninianus of just the sort prohibited by the *lex Cornelia* (Plate 31, 14). The Sn-Pb eutectic is 63% Sn and 37% Pb, similar to the measured composition here. The alchemical recipe includes Zn, but here we find a significant quantity of Cu (added presumably to increase the hardness). The Menelaus equation gives 8.59 ± 0.35 for the SG, higher than the observed 7.89, but it is hard to be sure why. For example, the highly corroded appearance of the coin is consistent with porosity or leaching.

15. The high phosphorous content is hard to explain, as it is usually associated with iron only (Plate 32, 15). Perhaps the bronze core (9% Sn) was tinned by cementation or diffusion in phosphorous-containing cassiterite? Most likely the P is intrusive, i.e., part of the burial patina. The Menelaus equation gives 8.75 ± 0.47 for the SG,⁴⁷ higher than the observed 8.01, and the coin is indeed heavily corroded. The mixed tin-lead coating seems to be the 50% Sn, 50% Pb *argenteum* referred to by Pliny 34.160–61, and so perhaps the P is a residue of the flux used in tinning?

16 and 17. Although minted in widely separated places these two coins were made by apparently identical means (Plate 32, 16 and 17). The Ag coating has partially worn away, but it is clear that the Pb content belongs with the coating and not the core. The SGs are

⁴⁶ His four coins are in Table 3A, 11 and 38, and Table 3B, 8 and 2. For coins 11 and 8, only segments of the faces are in pls. A and B and are very small. His coin 2 has a segment on pl. B plus two, 60 times enlarged photos of details (text pls. 14, 15). For coin 38 only the reverse is photographed (text pl. 184). Campbell's coins 8 and 38 display a gritty or grainy corroded surface similar to my coins 12, 13, and 16.

⁴⁷ Based on the Cu and Sn core only.

consistent with a simple Sn-bronze core with small quantities of Ag:⁴⁸ cp. the calculated 8.89 ± 0.24 with the observed 8.35 ± 0.01 for the ANA coin, and for the Illinois coin cp. 8.90 ± 0.25 with the observed 8.92 ± 0.02 . (If the Ag from the core be assumed to be the residue of the coating, we have for the calculated SGs 8.84 ± 0.23 and 8.86 ± 0.24 respectively.) These then would seem to be clear examples of silvering by the Ag-Pb alloy, as in Pliny 34.162-3 (Table 1, 4). But again, as 12 and 13, these may have been produced by fusing Pb-bearing Ag filings onto a bronze flan. Coin 17 is in very fine condition and gives no evidence of fusing as Campbell suggests, while 16 has much the same fuzzy corroded appearance as the fused Ag flans do. Each of these methods is suitable for production in bulk, again (as for 12 and 13) possibly even officially.

EVIDENCE OF SILVER IMITATIONS

For method 1 of silvering base flans, the use of white bronzes, there is ample evidence. The Libyan War coins confirm Bolos's later description of high-As white bronze as a silver substitute. In addition it would seem that cementation with burnt sandarach (As_2O_3) was used to finish the surfaces of some of the flans. Microscopic examination of cross sections would be revealing. In mid-second to early third century Rome, high-Sn bronze was used instead, as indicated in the later recipes of *P. Leiden X*. Although there is no reason to suspect surface enrichment in Sn by casting segregation ("sweating out")⁴⁹ or by cementation, microscopic examination of cross sections might be revealing.

Method 3, tin pewters of various sorts, is also clearly proven. Although artifacts of tin are known from before 2000 B.C.,⁵⁰ the only pure tin coin is the Bithynian example here (as noted above it is

⁴⁸ Again the uncertainties are halved as the Cu is over 90%.

⁴⁹ See N. D. Meeks, "Tin-Rich Surfaces on Bronze—Some Experimental and Archaeological Considerations," *Archaeometry* 28 (1986), pp. 133-62.

⁵⁰ W. Lamb, *Excavations at Thermi* (Cambridge, 1936) pp. 171-73 and 215, pl. 25, 30.24; Forbes (above, n. 32), pp. 134-52 and 166-71; Tylecote (above, n. 35), pp. 14-29.

possible that the core may contain some Pb). The earliest Roman tin-lead pewter coin seems to be the antoninianus of Gallienus here, although the *lex Cornelia* proves they were made in the first century B.C. From fourth century B.C. Macedonia comes evidence of tin-antimony pewter, not specifically attested in alchemy but much in keeping with the use of other white-metal alloys. The very low SG is acceptable at such a date, before Archimedes discovered SG (Vitr. 9 *praef.* 9–12). Other substitutes (pure tin and white bronze) also have low SGs, if not so low as this. One other Sn-Sb coin is known (and no other ancient artifacts): a denarius of A. Plautius, 54 B.C., with a composition of 70% Sn, 28% Sb (SG = 6.92).⁵¹

Two unusual alloys found are probably best understood as variants of tin pewters. The earlier variant is the zinc-silver alloy found by Buckley in a Bactrian obol of 152 ± 17 B.C.: 70% Ag, 25% Zn, 3.4% Cu (plus 0.46% Ni and 0.39% Pb). The substitution of metallic zinc for the more usual tin (as in *P. Leid* X, 3) may have been deliberate, or an accident, the alloyer misled by the resemblance. It may not be irrelevant that Theopompos (fr. 109 *G-H* = Strabo 13.1.56) indicates that zinc was called *ψευδάργυρος* (pseudo-silver). The metal for the flan must have been made by adding one part Zn to three parts coin-silver (5% Cu and 0.5% Pb). Metallic Zn was known in the fifth century B.C.⁵² If pseudo-silver added to copper made golden brass (as in Theopompos and Theophrastos), adding it to silver would have seemed a natural step.

The later variant of tin-lead pewters involves the substitution of antimony for tin and is found in first century B.C. Characene. This may have been made by inadvertently substituting antimony for tin, or as a deliberate variation on alchemical recipes (which later involved ternary Sn-Pb-Zn alloys: *P. Leid*. X, 11). Other “lead” coins from Characene exist but are alleged on no grounds at all to be non-mone-

⁵¹ G. F. Carter and W. H. Carter, “Chemical Analysis of a Plautia Denarius,” *Seaby Coin and Medal Bulletin* 560 (Feb., 1965), pp. 58–60, a reference I owe to Fred S. Kleiner. The coin is identified as BMC 3916.

⁵² M. Farnsworth, C. S. Smith, and J. L. Rodda, “Metallographic Examination of a Sample of Metallic Zinc from Ancient Athens,” *Hesperia Supplement* 8 (1949), pp. 126–29, pl. 16.

tary fakes. These others are from the Basra hoard of tetradrachms of Tiraïos II (*IGCH* 1786), and are dated [$\text{J}\Lambda\Sigma$ = 23x S.E. = 83–74 B.C.; $\text{A}\Xi\Sigma$ = 261 S.E. = 52/1 B.C.; and $\text{Γ}\Xi\Sigma$ = 263 S.E. = 50/49 B.C.⁵³ Others from the earlier king Attambelos (of ca. 2.5 g each, tetrobols?) were found at Susa and have been declared monetary.⁵⁴ The monetary character of lead issues has long been disputed though is now usually accepted,⁵⁵ and there is literary evidence that Pb was used for coins at Klazomenai and in Egypt at least.⁵⁶ The analyses show that these lead coins fit within the usual alchemical efforts to produce imitation silver, which is a strong argument in favor of their true monetary character. Other lead coins should be tested.

Method 4, baked-on coating, is also confirmed. Pliny mentions the Sn-Pb coating *argentarium*, but the earliest known coin therewith treated seems to be the antoninianus of Gallienus tested here. The apparent use of Ag-Pb baked-on coatings in third century antoniniani, noted already by Pliny, could be confirmed by metallographic examination. In fact without such examination it is hard to distinguish this method from that suggested by Campbell (direct fusion of possibly lead-containing Ag filings to the flan). I would argue that the use of Ag-Pb alloys of high lead content is much more likely: they may be attested, are more in keeping with alchemical practice, and would be far easier to use since they melt at a much lower temperature.

Finally there is one fourré coin with a lead-alloy core. Such a coinage is attested by the prohibition against *ὑπομόλυβδον* coinage in

⁵³ Le Rider (above, n. 43), pp. 243–45, esp. 243, n. 3 (see pls. 20 and 22).

⁵⁴ Le Rider (above, n. 43), pp. 236–37.

⁵⁵ Joseph G. Milne, "Leaden Coinages in Syria," *NC* 6, 5 (1945), pp. 134–36; H. H. Kricheldorf and W. Käß (above, n. 44); and Dan Barag, "Some Examples of Lead Currency from the Hellenistic Period," *Festschrift Mildenberg*, ed. A. Houghton et al. (Wetteren, 1984), pp. 1–5, pl. 3 (from Palestine and Syria). On the other hand, Catherine Virlouvet, "Plombs Romains Monétiformes et Tessères frumentaires. A propos d'une confusion," *Rev Num* 6, 30, 1988, pp. 120–48, seems to assume that leaden coins were not ever monetary.

⁵⁶ Klazomenai according to [Arist.] *Oec.* 2.2.16. For Egypt see V. B. Schuman, "The Leaden Coinage of Roman Egypt," *Chronique d'Égypte* 28 (1953), pp. 356–61; the numismatic evidence is in J. G. Milne, "The Leaden Token-Coinage of Egypt under the Romans," *NC* 68 (1908) 287–310.

375/4 B.C. (above), and there are examples of electrum-plated lead coins,⁵⁷ of which this would be a silver variant. Moreover, this would have been easier to make than a fourré with a copper core, would have been easier to strike, and would have been harder to detect (being closer in density and color of the core). With the Ag admixture and proper annealing it would have “rung” more truly than an unannealed pure lead coin. All in all, it is a better imitation than the earlier copper-cored flans.

There are a few methods not confirmed by this study. No evidence of pickling or the use of a cerargyrite hot-dip was found, see Table 1, 2 and 6. In pickled coins one would expect a core of say 30% Ag, but a surface of say 80 or 90% Ag, with all other elements in the core (Sn, Pb, etc.) being normal for bronze. Cope has suggested a “natural” pickling process in the normal course of events at a Roman mint from ca. A.D. 65 to 260 for flans of ca. 17 to 45% silver,⁵⁸ but the surface-silvered coins here (12, 13, 16 and 17) do not correspond to that model, as their cores are too base. Second, no conclusive evidence of the ternary Sn-Pb-Zn pewter was found, though it is possible that one pewter coin has core of this alloy. No evidence of the Sn-Ag alloy of *P. Leid.* X, 3 was found (although as noted above, a Zn-Ag coin from Bactria is known). No evidence was found for the use of Hg either as a constituent (as possibly in *P. Leid.* X, 5, 36 and 84) or as a vehicle for coatings (Pliny 34.162–63, *P. Leid.* X, 26, and 41). Well preserved Ag-foil fourrés would not have been detected by

⁵⁷ E. S. G. Robinson, “Some Electrum and Gold Greek Coins,” *Centennial Publication of the American Numismatic Society*, ed. Harald Ingholt (New York, 1958), pp. 585–94, 10–12 (pp. 591–93), lead cores; C. M. Kraay, “The Composition of Electrum Coinage,” *Archaeometry* 1 (1958), pp. 21–23, at p. 23, silver core, not otherwise identified; E. Pászthory, “Investigations of the Early Electrum Coins of the Alyattes Type,” *Metallurgy in Numismatics* 1, ed. D. M. Metcalf and W. A. Oddy, RNS Spec. Pub. 13 (London 1980), pp. 151–56, pl. 12–17, at pp. 153–54, silver core; Fr. Bodenstein, *Die Elektronmünzen von Phokaia und Mytilene* (Tübingen 1981), pp. 30–33 and 36–37, alludes to cores of silver and copper; and L. Avaldi, et al., “Quantitative Results of XRF Analysis of Ancient Coins by Monochromatic X-Ray Excitation,” *Archaeometry* 26 (1984), pp. 82–95, at p. 89, 53 (core not specified), a gold solidus of Honorius (398 ± 15 A.C.), Milan.

⁵⁸ Cope (above, n. 13) 267–69.

microprobe or XRF tests (a few were identified visually and will be noted in the larger study). Campbell's original work did not include chemical tests, and with the modern availability of microprobes I believe his valuable work ought to be repeated. It is difficult without microscopic metallographic examination coupled with microprobe tests to distinguish his suggested coating of baked-on Ag-filings from Pliny's more likely coating of a baked-on Ag-Pb alloy.

Looking at these coins, their bronze age antecedents, and the alchemy texts, one is struck by the unified picture. A group of metallurgical techniques had been evolving since ca. 2000 B.C. involving a wide variety of metals and coatings, and all of these plus a number of newer methods were used to imitate silver in coins. Further work will surely draw the connections between early metallurgy, alchemy, and coins even closer.⁵⁹

⁵⁹ This work began at the ANS in the Graduate Seminar of 1987. It was continued at the University of Colorado Museum, funded by university grants, and at the ANA, in 1988-89. The final stage was accomplished at the University of Illinois, Urbana-Champaign, in 1990 while on a George A. Miller Visiting Professorship at the Ancient Technologies and Archaeological Materials program. This article was written in Edmonton in 1993 while I was supported by the Izaak Walton Killam fellowship at the University of Alberta. I am grateful to all of the individuals who supported and assisted this work, especially to the curators of coins: William Metcalf (ANS), Fred Lange (U. of Colorado), Robert Hoge (ANA), and Sarah U. Wisseman and J. A. Dengate (U. of Illinois).

THE CHRONOLOGY OF AUGUSTAN ASSES AND QUADRANTES DETERMINED FROM CHEMICAL COMPOSITIONS

GILES F. CARTER

Augustan asses and quadrantes are essentially pure copper coins containing a number of trace elements for which the chemical concentrations vary from year to year, often significantly. For instance, the earliest Augustan asses, struck in 16 and 15 B.C. according to *RIC*,¹ contain relatively high concentrations of several elements such as nickel, silver, and antimony.² The later asses of 7 and 6 B.C. are purer with relatively low concentrations of these three elements. Finally the asses of 10-12 A.D. have very low impurities except for nickel, which once again is relatively high. The chemical compositions of Augustan asses obviously change from year to year, as may be seen in the summary presented in Table 1.

Determination of trends in chemical compositions by visual inspection alone is subjective and extremely difficult when several variables change slightly, such as found in some issues of Augustan quadrantes, for example. Changes in the chemical compositions of closely related

¹ C. H. V. Sutherland, *The Roman Imperial Coinage*, vol. 1 (London, 1984), pp. 69 and 70 (hereafter, *RIC*).

² G. F. Carter, "Chemical and Discriminant Analyses of Augustan Asses," *J. of Arch. Sci.* 29 (1993), pp. 101-15 (hereafter, "Asses").

issues of coins, however, suggest that information on their chronology may be present. Of course, the surest determination of chronology is from historical records or from dates on the coins themselves. For Augustan asses and quadrantes, some historical information is known, but much of the chronology is only approximate. It is hoped that chemical compositional data in addition to historical and numismatic information will produce the most accurate chronology possible.

Carter and Frurip have devised a method using chemical compositions to determine the chronology of groups of coins.³ Using their method, Carter and Frurip proposed a slight rearrangement of the chronology of Augustan quadrantes. Most postulated chronologies assign dates of 9, 8, 5, and 4 B.C. for the quadrantes with asses struck in 7 and 6 B.C. Carter and Frurip, however, believed that the quadrantes were struck in four consecutive years. More recently Carter⁴ has used the same method to confirm the chronology of Augustan asses as presented in *RIC*. In the present study the overall chronology of Augustan asses and quadrantes is investigated. Evidence is presented showing that the overall chronology as given by *RIC* requires some alteration.

METHODOLOGY

The method of Carter and Frurip⁵ depends on a mathematical treatment of data called "discriminant analysis." Discriminant analysis treats data for several groups, such as the chemical compositions of coins struck in different years. First the data are normalized so that one element does not overwhelm any other element regardless of the different magnitudes of concentration. For instance, variations in the concentration of a trace element such as nickel may even be more important than changes in the concentration of the major element

³ G. F. Carter and D. J. Frurip, "Discriminant Analysis of the Chemical Compositions and Physical Measurements of 245 Augustan Quadrantes," *Archaeometry* 27, 1 (1985), pp. 117-26 (hereafter, "Quadrantes").

⁴ "Asses."

⁵ "Quadrantes."

copper even though the concentration of nickel is about 0.02% and the concentration of copper is about 99.5%.

Discriminant analysis then reduces the chemical composition of each coin to one point in space. Coordinates of the points for every coin in a given group are then averaged to determine a group centroid. The centroids of the several groups are separated mathematically as far as possible from each other. The distance between each pair of centroids may then be calculated, and this distance is called the *Mahalanobis distance*.

For instance if there are four groups of coins, A, B, C, and D, then 24 chronologies are possible: ABCD, ABDC, ACBD, ACDB, ADCB, ADCB, BACD, etc. The method of Carter and Frurip depends on calculating the sum of distances among centroids for each chronology. For example, in the chronology ABCD, one would add the distance between the centroids of coin groups A and B, and the distance between the centroids for groups B and C, and the distance between the group C and D centroids. Carter and Frurip call the sum of these distances for a given chronology the *Mahalanobis Drift Distance* (MDD). The MDD is calculated for each possible chronology (which is quickly done using a computer). The basic hypothesis of Carter and Frurip is that *the most likely chronology is the one having the lowest MDD*.⁶

The rationale for this hypothesis is that when several variables change as a function of time, the centroid also varies with time. Normally the variation in chemical composition over a short period of time is small unless a radical change occurs in the ore source or in conditions for smelting or refining the metal. One may visualize a sort of meandering or drift of the centroid through space as a function of time. Because many variables are involved, it is reasonable to expect that the drift distance of centroids usually will be small for short intervals of time and that the centroids rarely double back on themselves. The net effect is that the lowest sum of Mahalanobis distances from the first centroid to the next and so on to the last centroid is very likely to represent the true chronology.

⁶ "Quadrantes."

Because the MDD is the same for the chronology ABCD as for DCBA, the method, by itself, cannot choose between a given chronology and its exact reverse. Usually, however, numismatic evidence can identify at least one group of coins as being earlier or later compared with the others, and then the correct chronology may be determined by the method.

Of course, one does not expect that the method will work in every case, but it has worked exceptionally well in test studies. For instance, the method was tested using distance and angular measurements taken from enlargements of Crepusius denarii, struck in 82 B.C.⁷ The chronology of the reverse dies of Crepusius is known because die control numbers from 1 to 519 were engraved in the reverse dies. Carter, Powell, and Frurip took six groups of reverse dies of Crepusius denarii from which ten distances and ten angles were measured for each of six coins in the six different groups. Each group comprised reverse dies having numbers in close proximity. The results using the above methodology produced the correct chronology for all six groups for the same engraver. When a similar test was made using coins engraved by a second engraver, again the correct chronology of all six groups was obtained. In both cases the method determined the one correct chronology out of a total of 360 possible chronologies.

A second study using different dies of Crepusius was made by Carter and Powell, and again the correct chronology was determined by the method.⁸ The evidence to date strongly supports the validity of the Carter-Frurip hypothesis. The method would likely not work, however, under the following circumstances: 1, if the groups of coins are separated far from each other in time; 2, if the groups involve dissimilar conditions, such as coins from different mints; 3, if there is one group that is extremely different in composition from two or three groups that are close to one another.

⁷ G. F. Carter, R. R. Powell, and D. J. Frurip, "The Evolution of Style in Dies of Crepusius Denarii," *Actas do Congresso Nacional de Numismatica*, ed. M. Gomes Marques (Lisbon, 1986), pp. 535-51.

⁸ G. F. Carter and R. R. Powell, "The Chronology of Groups of Dies for Large Issues of Ancient Coins Using Mahalanobis Distances," *Archaeometry* 36, 2 (1994), pp. 277-86.

A NEW CHRONOLOGY FOR THE COPPER COINS OF AUGUSTUS

The chronologies that have been suggested by various authors for Augustan asses and quadrantes are fairly similar. The British Museum Catalog⁹ arranged the earliest asses of Augustus differently from the Roman Imperial coinage:¹⁰ the college of Piso, Surdinus, and Rufus was assigned to 23 B.C. in the *BMCRE* compared with 15 B.C. in *RIC*. Likewise the college of Gallus, Celer, and Lupercus was assigned to 22 B.C. by the *BMCRE* compared with 16 B.C. for *RIC*. Using the MDD methodology for chemical compositions, Carter has shown that there is little doubt that the *RIC* chronology (not necessarily the exact dates) is correct, namely that the college of Gallus, Celer, and Lupercus is earlier than that of Piso, Surdinus, and Rufus.¹¹

Considering only the Augustan asses, the chronology is firmly indicated by discriminant analysis of the chemical compositions to be the following: 1, Gallus, Celer, and Lupercus; 2, Piso, Surdinus, and Rufus; 3, Agrippa, Tullus, and Otho; 4, Silianus, Quinctilianus, and Messalla; 5, Tiberius (Imperator V); and 6, Augustus (Imperator XX).¹² This agrees completely with the chronology in *RIC*.

For the Augustan quadrantes, Carter and Frurip¹³ found that the Pulcher, Taurus, and Regulus college (cited as 8 B.C.) was the earliest college of moneyers, followed by Lamia, Silius, Annus (cited as 9 B.C.). These apparently incorrect dates are postulated both by *RIC* and the *BMCRE*. Discriminant analysis showed that the Pulcher, Taurus, and Regulus college clearly was the earliest. The comparative rarity of coins struck by the PTR college may indicate that the striking of these coins was begun towards the middle of the year, or perhaps the mint production was limited during the initial period of striking quadrantes. Furthermore, the so-called 9 B.C. group of coins is fairly close in composition to the 5 B.C. group, comprising Apronius,

⁹ H. Mattingly, *Coins of the Roman Empire in the British Museum*, vol. 1 (London, 1965), pp. 28–35 (hereafter, *BMCRE*).

¹⁰ *RIC*.

¹¹ "Asses."

¹² "Asses."

¹³ "Quadrantes."

Galus, Messalla, and Sisenna. Some of the 9 B.C. coins have essentially the same chemical composition as some of the 5 B.C. coins. Close analysis of the analytical data leads one to believe that actually the quadrantes were struck in four consecutive years, in disagreement with both *RIC* and the *BMCRE*.

Because the evidence is strong that the chronology for the quadrantes needs to be changed to four consecutive years with the Pulcher, Taurus, and Regulus college first, the next question is how do the quadrantes mesh with the asses? The quadrantes were probably struck in different years from the asses because the college names are different. This assumption is confirmed by differences in chemical compositions between the quadrantes and the asses. Because both denominations are made from essentially pure copper, it is likely that there were no major differences in the smelting and purification of copper used for the asses or the quadrantes.

Because Augustan asses were struck in six different years and quadrantes were struck in four years, there is a total of ten years during which nearly pure copper coins were struck by Augustus. The problem is to arrange these ten groups or colleges into the proper chronological order. Of course, the MDD methodology is incapable of assigning specific dates to the colleges, but it is the method which is capable of producing the correct overall chronology.

RE-INVESTIGATION OF THE CHRONOLOGY OF AUGUSTAN QUADRANTES

Thirty Augustan quadrantes were selected for chemical re-analysis for two reasons: 1, more accurate chemical analyses of coins by x-ray fluorescence may now be obtained compared with the analyses made over a decade ago;¹⁴ and 2, three additional elements, namely cobalt, zinc, and arsenic, were determined so that the new analyses are comparable with the analyses of Augustan asses.

¹⁴ G. F. Carter, "Chemical Compositions of Copper-Based Roman Coins III: Augustan Quadrantes, ca. 9-4 B.C.," *Archaeological Chemistry* 2, ed. G. F. Carter (Washington, 1978), pp. 247-77 (hereafter, "Copper").

Accordingly, from the quadrantes analyzed prior to 1978 by Carter¹⁵ six coins were randomly chosen from each of the following groups: 1, the college of Pulcher, Taurus, and Regulus, 8 B.C.; 2, Lamia, Silius, and Annus, 9 B.C.; 3, Apronius, Galus, Messalla, and Sisenna, 5 B.C.; 4, Blandus only, 4 B.C.; 5, Catullus only, 4 B.C. Chemical analyses were performed for ten elements by x-ray fluorescence. These analyses are believed to be more accurate (i.e., closer to the true composition), and for several elements to be more precise as well (i.e., less instrumental variation), than the earlier analyses reported by Carter.¹⁶

Discriminant analysis of the compositions produced the same chronology which was found earlier by Carter and Frurip,¹⁷ namely in the order given in the above paragraph. Many of the coins struck by Catullus in 4 B.C. are significantly different in chemical composition from the other 4 B.C. coins, such as those of Blandus. Probably the issue of Catullus was the last one in the year, and it seems to be a larger issue than those struck by other moneyers in the same year. It is hypothesized that Catullus struck coins for a significant period of time after the other moneyers had ceased that year.

Occasionally the concentration of a given element, often iron, is far greater than the average for the other coins in a group. When this occurs, the "outlier" coin must be omitted from the discriminant analysis. Otherwise the single high concentration strongly affects not only the average concentration for a given element, but also the standard deviation (which is indicative of the range of concentrations for an element in a given group of coins). Three outliers were found among the 30 quadrantes analyzed and eight outliers were among the 69 Augustan asses. All 11 outliers were omitted from the discriminant analyses.

The new chemical compositions of the 30 quadrantes used in this study are given in Table 2. Discriminant analysis and the use of the Carter-Frurip MDD method for all five groups produced the following chronology: P L A B C, where P is the abbreviation for the Pulcher,

¹⁵ "Copper."

¹⁶ "Copper."

¹⁷ "Asses."

Taurus, and Regulus college of moneyers, L represents the Lamia, Silius, and Annius college, A represents the Apronius, Galus, Messalla, and Sisenna college, B is Blandus, and C is Catullus.

To investigate the chronology further, five combinations of four groups were analyzed by the MDD method. The results, which were obtained in five determinations, or "runs," are shown in Table 3 and indicate the following to be preferred chronologies: run 1, P A B C; run 2, P L B C; run 3, L A B C; run 4, P A L C (this shows the Lamia group in the wrong place but the second preferred chronology of run 4 gave the order P L A C, which is consistent with the preferred chronology found in the first three runs); run 5, P L A B was essentially tied in probability with P A B L and with P L B A.

Taking all these runs into consideration, the evidence is convincing for the chronology P L A B C. In the fifth run above, note that the college of Pulcher, Taurus, and Regulus is first, or earliest, in all three chronologies that are essentially equally preferred. The MDD values for all five runs are presented in Table 3 along with comments on each run.

The relative magnitude of the Mahalanobis distances between various centroids usually indicates which groups are closest together in time. For example, in run 1 in Table 3 the Mahalanobis distances between the Pulcher college (abbreviated P) and the Apronius college (A) is 5.1. The distance between P and B (Blandus) is 5.8, and the distance between centroids P and C (Catullus) is 6.0. These Mahalanobis distances are very large, indicating a great difference in composition between the coins of the Pulcher college and the coins of the other colleges that struck quadrantes (the Lamia college, however, was not included in this run).

For comparison, in run 1 the Mahalanobis distance between centroids of the Apronius college and Blandus is only 1.6, indicating great similarity in the chemical compositions of these coins. The distance between the centroids of Blandus and Catullus is 3.1, indicating a moderate separation in composition on the average. The comments in both Tables 3 and 4 are based on comparisons of various Mahalanobis distances.

Both the *BMCRE* and *RIC* give the chronology of Augustan quadrantes, incorrectly I believe, as L, P, A, and B. Of course, these

references do not differentiate whether Blandus or Catullus is last because these two moneyers are from the same college.

OVERALL CHRONOLOGY OF AUGUSTAN COPPER COINS

Four denominations of copper-based coins were struck in Rome by Augustus. Properly speaking, these comprise the two copper denominations, quadrantes and asses, which are essentially pure copper, and the two brass or orichalcum denominations, dupondii and sestertii. "Bronze" is a term that should be restricted in use to copper alloys containing appreciable concentrations of tin. The Augustan orichalcum denominations contain moderately high concentrations of zinc (usually over 20%), and the high zinc content affects some of the trace element concentrations such as iron. Therefore it may not be possible to employ the MDD method to both orichalcum and copper coins at the same time. The present study concerns only the chronology of the copper coins, quadrantes and asses.

The chronology of the asses given by *RIC* was completely confirmed by the MDD method.¹⁸ The primary question is where do the quadrantes fit into the overall chronology? Ten groups (grouped by the year in which they were struck) are far too many to treat at one time by the MDD method. It is necessary to make many determinations of various combinations of four groups to arrive at the overall chronology.

Accordingly 16 MDD runs were carried out (see Table 4). Twelve of the 16 runs produced one consistent chronology. Two of the runs, runs 7 and 10, each gave a pair of chronologies having about the same probability; in both cases one chronology of the pair was consistent with the chronology of the other 12 runs. Only two out of the 16 runs gave inconsistent chronologies with the majority. In run 11 in Table 4 the order of Blandus's and Catullus's coins was reversed, but because both of their coins were struck by the same college, this is not a serious problem. The other run having an outright inconsistency in chronology (i.e., error when compared with the overwhelming majority

¹⁸ "Asses."

of runs) was run 9, which reversed the order of the Apronius college (5 B.C.) with Catullus (4 B.C.).

Table 4 summarizes the chronologies found for all 16 MDD determinations for various combinations of groups of coins. Further comments on the results are given in the table based on comparisons of Mahalanobis distances between various centroids. The results repeatedly show that all four years of the quadrantes come before the 7 and 6 B.C. asses of Augustus. Every run in which this was investigated produced this chronology. The overall chronology based on chemical compositions is as follows:

Gallus, Celer, and Lupercus, *RIC* 16 B.C.

Piso, Surdinus, and Rufus, *RIC* 15 B.C.

Pulcher, Taurus, and Regulus

Lamia, Silius, and Annius

Apronius, Galus, Messalla, and Sisenna

Blandus, Bassus, Capella, and Catullus

(Catullus was the last series struck by this college)

Agrippa, Tullus, and Otho, *RIC* 7 B.C.

Silianus, Quinctilianus, and Messalla, *RIC* 6 B.C.

Tiberius (Imperator V), *RIC* A.D. 8–10

Augustus (Imperator XX), *RIC* A.D. 11–12

From the MDD determinations based on many chemical compositions, it appears necessary to assign new dates to the Augustan quadrantes. Although this must be left to numismatists, the dates possibly are 11, 10, 9, and 8 B.C. or perhaps 12, 11, 10, and 9 B.C. with an intervening year between the production of quadrantes and the production of asses in 7 B.C.

CONCLUSION

The chronology of the ten years in which the copper-rich coins of Augustus were struck has been determined using the Mahalanobis Drift Distance method (MDD) of Carter and Frurip.¹⁹ This method, using the mathematical technique of discriminant analysis, was

¹⁹ "Quadrantes."

applied to the chemical compositions of 30 Augustan quadrantes and 69 Augustan asses. The chronology is similar to that provided by *RIC*, but it differs in that all four years in which the quadrantes were struck occur before the asses of 7 and 6 B.C. Also the first quadrantes to be struck were by the moneyers, Pulcher, Taurus, and Regulus, rather than by Lamia, Silius, and Annius.

TABLE 1

Summary of Chemical Compositions of Augustan Asses

Wt % ^a	Fe ^b	Co	Ni	Cu	Zn	As	Ag	Sn	Sb	Pb	Date Group ^c	Number of coins
Average	0.89	0.004	0.51	96.3	0.01	0.08	0.58	0.032	1.49	0.13	16 B.C.	12
s.d. ^d	0.71	0.003	0.19	0.9	0.01	0.02	0.30	0.020	0.71	0.07	GCL	
Average	0.58	0.002	0.16	98.4	0.01	0.07	0.17	0.021	0.47	0.12	15 B.C.	19
s.d.	0.65	0.002	0.08	0.9	0.01	0.04	0.10	0.012	0.25	0.10	PSR	
Average	0.25	0.002	0.057	99.5	0.02	0.04	0.056	0.023	0.037	0.05	7 B.C..	18
s.d.	0.29	0.003	0.033	0.3	0.01	0.04	0.024	0.019	0.064	0.05	ATO	
Average	0.23	0.001	0.064	99.5	0.02	0.02	0.026	0.031	0.009	0.14	6 B.C.	8
s.d.	0.08	0.001	0.057	0.2	0.01	0.01	0.013	0.028	0.010	0.20	SQM	
Average	0.21	0.012	0.16	99.5	0.02	0.02	0.022	0.035	0.003	0.06	A.D. 10	6
s.d.	0.13	0.007	0.05	0.1	0.02	0.01	0.009	0.039	0.008	0.03	IMP V	
Average	0.50	0.014	0.18	99.2	0.01	0.01	0.019	0.013	0.002	0.02	A.D. 11	6
s.d.	0.48	0.005	0.06	0.5	0.01	0.01	0.005	0.016	0.004	0.02	IMP XX	

^a Data taken from Carter (above, n. 2)

^b Fe, iron; Co, cobalt; Ni, nickel; Cu, copper; Zn, zinc; As, arsenic; Ag, silver; Sn, tin; Sb, antimony; Pb, lead.

^c GCL, Gallus, Celer, Lupercus; PSR, Piso, Surdinus, Rufus; ATO, Agrippa, Tullus, Otho; SQM, Silianus, Quinctilianus, Messalla; IMP V, Tiberius Imperator V; IMP XX, Augustus Imperator XX.

^d Standard deviation

TABLE 2
Chemical Compositions of Augustan Quadrantes

Coin Wt. %	Fe ^a	Co	Ni	Cu	Zn	As	Ag	Sn	Sb	Pb	Group ^b
792	0.113	N.D. ^c	0.017	99.5	N.D.	0.05	0.105	0.016	0.145	0.01	PTR
793	0.175	N.D.	0.018	99.5	0.01	0.05	0.064	0.014	0.141	0.02	PTR
794	0.081	N.D.	0.017	99.6	0.01	0.02	0.076	0.014	0.161	0.01	PTR
809	0.198	N.D.	0.014	99.5	0.01	0.04	0.058	0.014	0.148	0.01	PTR
817	0.134	N.D.	0.015	99.5	0.01	0.05	0.072	0.016	0.179	N.D.	PTR
821	0.158	N.D.	0.022	99.5	0.01	0.04	0.077	0.018	0.150	0.02	PTR
833	0.124	0.001	0.015	99.8	0.01	0.03	0.042	N.D.	0.037	0.00	LSA
842	0.117	N.D.	0.009	99.6	0.01	0.04	0.039	0.008	0.073	0.14	LSA
863	0.171	N.D.	0.012	99.4	0.02	0.02	0.078	0.004	0.069	0.21	LSA
797	0.101	0.001	0.016	99.6	0.01	0.05	0.049	0.013	0.147	N.D.	LSA
917 ^d	0.69	0.002	0.015	99.1	N.D.	0.01	0.029	N.D.	0.056	0.07	LSA
928	0.104	N.D.	0.011	99.5	0.01	0.03	0.077	N.D.	0.040	0.27	LSA
801	0.233	0.001	0.014	99.6	0.01	0.03	0.084	N.D.	0.036	N.D.	AGMS
834	0.074	N.D.	0.016	99.6	N.D.	0.06	0.065	0.009	0.125	N.D.	AGMS
840	0.121	0.001	0.014	99.6	0.01	0.03	0.070	0.003	0.075	0.11	AGMS
843	0.118	N.D.	0.014	99.8	N.D.	0.01	0.058	N.D.	0.034	N.D.	AGMS
852	0.107	0.001	0.013	99.8	N.D.	0.01	0.060	N.D.	0.024	N.D.	AGMS
885	0.238	0.001	0.018	99.5	0.02	0.06	0.065	0.006	0.078	0.01	AGMS
803	0.158	N.D.	0.017	99.6	0.01	0.03	0.039	0.005	0.080	0.06	B
823	0.46	0.001	0.016	99.4	0.02	0.02	0.069	0.004	0.049	N.D.	B
835	0.104	N.D.	0.015	99.7	0.01	0.03	0.061	0.004	0.043	0.02	B
847	0.156	N.D.	0.015	99.7	N.D.	0.04	0.060	N.D.	0.033	N.D.	B
856	0.236	N.D.	0.014	99.7	0.01	0.02	0.057	N.D.	0.033	N.D.	B
862	0.053	0.001	0.016	99.7	0.01	0.04	0.047	0.005	0.081	0.08	B
841 ^d	0.174	N.D.	0.018	99.0	0.07	0.01	0.041	0.385	0.073	0.18	C
877	0.186	N.D.	0.016	99.7	0.01	0.02	0.053	0.008	0.040	N.D.	C
880 ^d	0.52	0.001	0.018	98.9	0.03	0.04	0.038	0.025	0.268	0.16	C
883	0.213	0.001	0.023	99.3	0.02	0.04	0.055	0.011	0.146	0.16	C
888	0.271	0.001	0.016	99.4	0.01	0.04	0.039	0.011	0.097	0.12	C
890	0.290	0.001	0.019	99.4	0.02	0.02	0.035	0.006	0.102	0.09	C

^a Fe, iron; Co, cobalt; Ni, nickel; Cu, copper; Zn, zinc; As, arsenic; Ag, silver; Sn, tin; Sb, Antimony; Pb, lead.

^b PTR, Pulcher, Taurus, Regulus, *RIC* 8 B.C.; LSA, Lamia, Silius, Annius, *RIC* 9 B.C.; AGMS, Apronius, Galus, Messalla, Sisenna, *RIC* 5 B.C.; B Blandus, *RIC* 4 B.C.; C, Catullus, *RIC* 4 B.C..

^c None detected.

^d Outlier composition.

TABLE 3
Chronology of Augustan Quadrantes

Run 1					
	Chronology	P A B C	A B C P	P B A C	Preferred Chronology: Pulcher college Apronius college Blandus Catullus
	MDD	9.8	10.7	11.6	
The Pulcher college is far removed from all the others. The Apronius college and Blandus are close together in composition.					

Run 2					
	Chronology	P L B C	L B C P	P L C B	Preferred Chronology: Pulcher college Lamia college Blandus Catullus
	MDD	9.4	10.1	10.5	
The Pulcher college again is far removed from all the others. The Lamia college and Blandus are fairly close to each other.					

Run 3					
	Chronology	L A B C	A L B C	C L A B	Preferred Chronology: Lamia college Apronius college Blandus Catullus
	MDD	7.9	8.4	9.3	
The Apronius college is close to both the Lamia college and Blandus. Catullus is far removed from both the Lamia and Apronius colleges.					

Run 4					
	Chronology	P A L C	P L A C	P C L A	Preferred Chronology: Pulcher college Apronius college Lamia college Catullus
	MDD	9.5	10.4	10.7	
The preferred chronology is not consistent with the above three runs. The Pulcher college is the earliest college.					

Run 5					
	Chronology	P A B L	P L B A	P L A B	Indeterminate Chronology: all three are close.
	MDD	7.7	8.0	8.2	
The Pulcher college is first and far removed from all the others.					
Blandus and the Apronius and Lamia colleges are all close together.					

MDD means Mahalanobis Drift Distance.

The smallest MDD indicates the preferred chronology.

A difference of 1.0 in two MDD values for two alternate chronologies is moderately large, whereas a difference of 2.0 is extremely large.

The overall most probable chronology is the following: Pulcher college, Lamia college, Apronius college, Blandus, and finally Catullus.

TABLE 4
Chronology of Augustan Copper Coins

Run 1				
	Chronology	16 15 P&L 7&6	16 15 7&6 P&L	Preferred Chronology: 16 B.C 15 B.C. P and L colleges* 7 and 6 B.C.
	MDD	11.5	11.9	
These two chronologies are highly preferred over all others. The 16 B.C. group is extremely far removed from all other groups.				

Run 2				
Chronology	16&15 P&L A&B 7&6	16&15 A&B P&L 7&6	Preferred Chronology: 16 and 15 B.C. P and L colleges A and B colleges 7 and 6 B.C.	
MDD	5.2	5.5		
The wide diversity within the combined 16 and 15 BC group causes low MDD values.				
The group comprising the Apronius college and Blandus and Catullus is close to the 7 and 6 B.C. group.				

Run 3					
Chronology	15	P	7	6	Preferred Chronology: 15 B.C. Pulcher college 7 B.C. 6 B.C.
MDD	8.6		8.9		
The 15 B.C. coin group is moderately far removed from all other groups of coins.					
The 7 B.C. and 6 B.C. coin groups are close together.					

Run 4			
Chronology	15 C 7 6	C 7 6 15	Preferred Chronology: 15 B.C. Catullus 7 B.C. 6 B.C.
MDD	7.9	8.3	
The 15 B.C. coin group is far removed from all other groups of coins.			
The Catullus group is much closer to the 7 B.C. group than to the 6 B.C. group.			

* The coins of the Pulcher and Lamia colleges were combined into one group. Other combined coin groups are also indicated in the same way.
MDD means Mahalanobis Drift Distance.
All dates are given as B.C. unless indicated by A.D.
The two most probable chronologies are presented for each run.
A difference of 1.0 in two MDD values for two alternative chronologies is moderately large, whereas a difference of 2.0 is extremely large.
Dates are from the RIC (Ref. 1).
The overall chronology is strongly indicated to be as follows:
16 B.C., 15 B.C., Pulcher college, Lamia college, Apronius college, Blandus, Catullus, 7 B.C., 6 B.C., 10 A.D., and finally 11 A.D.

Run 5				
Chronology	15 All Q 7&6 10-12A.D.	All Q 15 7&6 10-12A.D.	Preferred Chronology: 15 B.C.	
MDD	11.8	13.4	All quadrantes 7 and 6 B.C. 10-12 A.D.	
The first chronology is strongly preferred over all others.				
The combined 10-12 A.D. group of coins is far removed from all other groups.				

Run 6				
Chronology	15 L&A 7&6 10-12A.D.	L&A 15 7&6 10-12A.D.	Preferred Chronology: 15 B.C.	
MDD	11.2	12.4	L and A colleges 7 and 6 B.C. 10-12 A.D.	
The 15 B.C. coin group is far removed from all other groups.				
The combined 10-12 A.D. coin group is very far removed from all other groups.				

Run 7				
	Chronology	A 7 15 10 A.D.	15 A 7 10 A.D.	Preferred Chronology: Either one.
	MDD	11.4	11.5	
The two preferred chronologies are essentially the same in probability.				
The 10 A.D. coin group is very far removed from all other groups.				

Run 8			
Chronology	P C 7 B.C. 6 B.C.	P C 6 B.C. 7 B.C.	Preferred Chronology: Pulcher college Catullus 7 B.C. 6 B.C.
MDD	12.5	13.4	
The Catullus coin group is closer to the 7 B.C. group than to the 6 B.C. group. The Pulcher college coin group is extremely far removed from the 7 and 6 B.C. groups.			

Run 9				
	Chronology	C A 7 6	A C 7 6	Preferred Chronology: Catullus Apronius college 7 B.C. 6 B.C.
	MDD	9.9	11.1	
Both of the groups of quadrantes come before the 7 B.C. coin group.				
The preferred chronology is "incorrect" in that it differs from the above overall chronology.				

Run 10					
Chronology	A B 7 6		B A 7 6		Preferred Chronology: Both are equal.
MDD	7.9		7.9		
Both chronologies are equally probable and are more probable than any of the other chronologies.					
The Apronius college group is extremely close to the Blandus group.					

Run 11					
	Chronology	C B 7 6	B C 7 6	Preferred Chronology: Catullus Blandus 7 B.C. 6 B.C.	
	MDD	9.6	10.9		
The preferred chronology is "incorrect" according to the large majority of above runs. Both Catullus and Blandus come before the 7 B.C. group of coins.					

Run 12				
	Chronology	P A 7&6 10 A.D.	P A 10 A.D. 7&6	Preferred Chronology: Pulcher college Apronius college 7 and 6 B.C. 10 A.D.
	MDD	13.7	17.3	
The first chronology is extremely highly preferred over all others.				
The 10 A.D. coin group is much closer to the combined 7 & 6 B.C. group than to the Apronius college group.				

Run 13				
Chronology	C 7 6 10 A.D.	C 6 7 10 A.D.	Preferred Chronology: Catullus group 7 B.C. 6 B.C. 10 A.D.	
MDD	12.5	13.7		
The Catullus group is far from all the other groups, but especially from 10 A.D. The 7 and 6 B.C. coins groups are fairly close together.				

Run 14				
Chronology	B 7 6 10 A.D.	7 B 6 10 A.D.	Preferred Chronology: Blandus group 7 B.C. 6 B.C. 10 A.D.	
MDD	10.4	12.6		
The first chronology is highly preferred. The Blandus group is moderately close to the 7 B.C. group, but is much farther from 6 B.C.				

Run 15				
Chronology	Q 7&6 10 A.D. 11 A.D.	Q 7&6 11 A.D. 10 A.D.	Preferred Chronology: All quadrantes 7 and 6 B.C. 10 A.D. group 11 A.D. group	
MDD	10.5	12.0		
The 10 A.D. coin group is close to the 11 A.D. coin group. The combined group of all quadrantes is extremely far from the 10 and 11 A.D. groups.				

Run 16				
Chronology	7 6 10 A.D. 11 A.D.	6 7 10 A.D. 11 A.D.	Preferred Chronology: 7 B.C. 6 B.C. 10 A.D. 11 A.D.	
MDD	8.4	9.6		
The 10 A.D. coin group is very close to the 11 A.D. coin group.				
The 10 A.D. coin group is significantly closer to the 6 B.C. group than it is to the 7 B.C. group.				

BOOK REVIEWS

ANCIENT

JURII G. VINOGRADOV AND SERGEJ D. KRYZICKIJ, *Olbia, Eine altgriechische Stadt im nordwestlichen Schwarzmeerraum*. Leiden, New York, Köln: E. J. Brill, 1995. 168 pp. (119 pls. ISBN 90-04-09677-9. \$ 77.25.

This book synthesizes almost 150 years of study of the Black Sea city-state of Olbia and her *chora* (countryside). The authors of two previous monographs (E. Bellin de Ballu, *Olbia. Cité antique du littoral nord de la Mer Noire*, 1972, and A. Wasowicz, *Olbia Pontique et son territoire*, 1975) attempted syntheses, but these attempts were not successful. Wasowicz's book was to show how the Olbiopolitan settlers opened up the new territory. The monograph of E. Bellin de Balu is marred by numerous errors. In their new book Vinogradov and Kryzhitskii avoid the imperfections of their predecessors. The authors based their research on the analysis of literary, epigraphic, numismatic, and archaeological evidence. The authors have synthesized the results and reconstructed all aspects of the political, economic, cultural, and religious life of the Olbian Polis.

The material remains form the basis of Vinogradov and Kryzhitskii's investigation. They present to Western readers new and up-to-date (1994) archaeological evidence, including epigraphic and numismatic material from the archaic to the Roman period. The first chapter begins with the history of research on ancient Olbia and gives a bibliographic survey of Russian and Ukrainian scholarly literature, which will be new to most Western scholars.

The next chapter presents Sergei Kryzhitskii's study of the paleogeography and topography of Olbia, including the stratigraphy and

chronology of the main site of the excavation. Chapter four is a survey of the architectural complexes. Kryzhitskii presents the results of his extensive investigation of the ancient monuments and has classified the city's architectural objects according to the new chronology of Olbia's history.

The next chapter describes the development of the Berezan settlement, the first Greek colony on the north Pontic shore. This settlement was founded in the late seventh century B.C. and was abandoned by the end of the fifth century, when Olbia became the dominant city of the region, but the history of these two ancient centers is closely connected. Archaeological reconnaissance and excavations have revealed more than 180 agrarian settlements around Olbia. The authors emphasize that the extent of Olbia's *chora* is one of the most sensitive indicators of Olbia's prosperity.

One of the most important sections of the monograph is devoted to trade and monetary circulation in the Olbian polis. This research is based on analysis of the archeological materials, statistical research on the amphorae and other ceramic finds, an analysis of the crafts and manufactured items, and the food economy. Vinogradov, the author of this part of the book, is one of the great authorities on epigraphy of Black Sea region, and here he makes use of ancient authors, epigraphic sources, and coin finds.

Vinogradov points out that the first Ionian settlements on the northwestern shores of the Euxine had strong trade relations with both their metropolis and the local inhabitants. In the archaic period these links can be traced through finds of peculiar coins in the form of barbed arrowheads. The finds show that these coins received widespread distribution in the first half of the sixth century B.C. among the Thracian and Scythian tribes as well as in Olbia. Later in the second half of the sixth century B.C. another form of a primitive coin, small copper pieces cast in the shape of dolphins, adapted and improved upon the local tradition of circulating small cast bronze artifacts. For local trade Olbia not only used cast bronze coins but also produced bronze balance weights, some of which are decorated with images of the arrow and dolphin coins. The author demonstrates that the increasing political influence of the Scythians, after their defeat of Darius, was accompanied by their advance on Olbia. As a result the

extensive Olbian *chora* shrank in size in the beginning of the second quarter of the fifth century B.C. This led to a shrinkage of the agricultural sector in the city's economy. Olbia compensated for this loss by intensifying her external trade. The city became the entrepôt for trade with Scythian tribes, with many centers in mainland Greece, and with the islands of the Mediterranean. As the wheat supplier from the Black Sea hinterland to Attica, the Olbian polis was particularly close to Athens. Olbia imported black lacquer and red lacquer Attic ceramics on a large scale and vine and olive oil from Thasos, Chios, Lesbos, Mende, Samos, and other Mediterranean centers.

The electrum coinage of Cyzicus, Lampsacus, and Miletus was used in Olbia's foreign trade. The Cyzicenes were the principal payment medium throughout the classical period. But the Olbiopolitans could not get along without their own coinage in the domestic market, and full-value bronze obols and their fractions made their appearance in the second quarter of the fifth century B.C. The first group bore the head of Athena and a wheel with letters ΠΑΥΣ, and the second group had a gorgon head and the radial placement of the letters ΑΡΙΧ between the spokes. The appearance of the magistrates' names (ΠΑΥΣΑΝΙΚΑΣ and ΑΡΙΧΟΣ) without full name of the city on the first cast copper coins reinforces the thesis that the economic connections with Attica led to a political union and that Olbia was part of the Athenian maritime league. The author concludes that this event took place at the time of Pericles' expedition to the Euxine Sea (437 B.C.). At the same time Olbia continued to develop trade contacts with the Scythian hinterland and supplied it with wine in amphorae, expensive bronze vessels, jewelry from Greece, and its own manufactures. Strong links with Scythia are reflected in the first Olbian silver coins, which were struck around the third quarter of the fifth century B.C. These so-called staters of Eminakos combine Greek myths about Hercules with the local Scythian epic tradition. From an analysis of the epigraphical sources in combination with archaeological materials from Sinope, Heraclea, Chersonesus, and Tauricus, Vinogradov suggests that the temporarily broken contact between the metropolis and Black Sea *apoikoi* led to an economic union of Pontic cities. From Pontic centers Olbia imported not only vine and olive oil, but also building materials, tiles, and the famous red ochre (*Sinopis*).

A change of Olbia's coin type reflects the weakening of Athenian influence on the Black Sea littoral during the Peloponesian War. At the end of the fifth century B.C., a new series of small coins with a gorgon head and an eagle, the first with the short name of the city instead of magistrates' names, were issued. The next type, dated to the 370s B.C., with the image of Demeter and an eagle on a dolphin and the full name of the city in the Ionian form **OLABIH**, shows that issuance of coins had passed into the hands of the state. Increasing foreign trade in the fourth century compelled the city to adopt the Greek polis standard. At the beginning of the fourth century new copper coins appeared and fifty years later, silver ones of the same type (Demeter/eagle on dolphin) appeared. The authors point out that in the third quarter of the fourth century the administrative structure of the city tried to regulate the trade operations in the market and issued the so-called Kanob's decree. According to this law, the Cyzicenes had to be exchanged for a fixed rate for the Olbian copper and silver coins.

In 331 B.C. Olbia successfully resisted capture by Zopirion, an officer of Alexander the Great, and at the end of the 320s began to strike gold coins. Vinogradov argues that this was an expression of the city's sovereignty. The silver coins of Demeter and dolphin with eagle types continued to be produced, and a new issue of copper coins with the image of the river god Borysthenes began. Vinogradov points out that in the hellenistic period gold staters of Alexander and, later, Lysimachus type replaced the Cyzicenes in Olbia's domestic and foreign trade.

A serious economic crisis began in the second part of the third century B.C. Vinogradov believes this crisis was connected with the ethno-political situation on the steppes. The newcomers, the Sarmatian tribes, were herdsmen, and the struggle for pasturage created a bitter collision between the them and the farmers of the steppes. The military threat from the barbarian tribes destroyed the agricultural economy and Olbia was forced to import wheat for its own needs. Olbia's currency also bears witness to the fluctuations in the city's economy at that time. The silver coins stopped being issued and the copper coins were given a compulsory exchange rate, their types were frequently altered, and they were countermarked and overstruck. A

temporary economic stabilization, marked by the resumption of the issue of silver coins in the second quarter of the second century B.C. is connected by Vinogradov with the activity of King Pharnaces, the defender and unifier of the Black Sea hellenic world against the barbarian tribes. But by the middle of the second century the political situation had deteriorated again. Olbia had to pay tribute to the barbarian rulers, and it became part of the protectorate of the Scythian king Scilurus, who struck in the city's mint bronze coins in his own name. At the end of the second century Olbia became part of the realm of Mithradates Eupator. The author shows that at that time many bronze coins of the cities of Pontus and Paphlagonia circulated in the city. This economic recovery was interrupted in the middle of the first century when the Getae destroyed the city. Vinogradov says this is the end of the first period of the Olbian history, which was characterized by the highest level of economic development.

Recovery was slow, and Olbia was renewed as an urban center only at the beginning of the first century A.D. At the end of the reign of Claudius the city began to issue bronze and later silver coins. From the fifties until the time of Domitian, the Olbian mint struck gold staters of the Attic standard and later Roman gold coins—aurei with name of Sarmatian king Pharzozj. In the second part of the first century A.D. coins with the name of the Sarmatian king Inesmeios (Inensimeos) were issued. During the final period of economic prosperity under the Severans Olbia was included in the province of Moesia and issued typical provincial coins. The biggest export of coins from the Roman Empire occurred in the late second and early third centuries. Local minting of coins ceased after Alexander Severus. Small imports of foreign coins continued until the end of Olbian history in the fourth century A.D. The author concludes that even though the city had several periods of economic prosperity, the economic potential of Olbia after the Getic destruction never reached the levels of the hellenistic period.

The next three chapters are devoted to the art, religion, and necropolis of ancient Olbia. The author analyses the sculptures, terracottas, metalwork, and ceramics of the Olbian workshops. The religious crafts testify to the high level quality of Olbian art, and the artifacts found

in the necropolis contribute to the further knowledge of Olbian culture and life.

The authors sum up their conclusions in the final chapter, and the monograph concludes with 119 plates of archeological findings and architectural reconstructions. All coins illustrated were attributed by the outstanding researcher in Olbian coins, Peter Karyshlovskii (1921–88). His encyclopedic knowledge of the currency and monetary circulation of northern Black Sea region will be a valuable basis for subsequent generations of scholars.

This is the first study in a western language to synthesize all scholarly resources in reconstructing the historical background of the ancient Greek colony in the north of the Black Sea, and is a worthy contribution to the literature. Few scholars have covered so much ground with so much authority. The two authors are now based in different countries, Vinogradov in Russia, Kryzhitskii in the Ukraine; but it is most gratifying that despite the dissolution of the Soviet Union such scholarly co-operation is still possible, not least when it results in works of such high quality.

ELENA STOLYARIK

The American Numismatic Society

R. A. HAZZARD, *Ptolemaic Coins: An Introduction for Collectors*. Toronto: Kirk & Bentley, 1995. 132 pp., 153 text figs. ISBN 0-9699793-0-4. \$ 39 (U.S.).

WOLFRAM WEISER, *Katalog Ptolemäischer Bronzemünzen der Sammlung des Instituts für Altertumskunde der Universität zu Köln*, Sonderreihe Papyrologica Coloniensia. vol. 23, Abhandlungen der Nordrhein-Westfälischen Akademie der Wissenschaften. Opladen: Westdeutscher Verlag, 1995. 127 pp., 45 pls. ISBN 3-531-09937-X. DM 76, ÖS 593, SFr 66.

Despite an unassuming title and disclaimers in the foreword, Richard Hazzard's *Ptolemaic Coins* will be useful to scholars. To be sure, the author has made compromises in presentation to keep his essays accessible to hobbyists. But familiarity with the fields of

history and papyrology gives his discourse a distinctive flavor, and his frequent citation of the relevant ancient sources makes his book a valuable resource for other numismatists. Beyond this, important ideas from Hazzard's recent papers are better integrated into an historical overview, and some are developed fully for the first time. Hazzard also broaches new themes that will doubtless be pursued in future research. His principal contributions to scholarship fall under three broad headings: 1. chronology; 2. monetary functions of Ptolemaic coinage, especially in the context of royal finance; and 3. iconography and its cultural significance.

In matters of chronology, Hazzard often disagrees with two distinguished specialists in Ptolemaic numismatics, Alain Davesne and the late Otto Mørkholm. He expresses skepticism about aspects of Davesne's arrangement of the coinage of Ptolemy I and II in *Gülnar 2* (A. Davesne and G. Le Rider, *Gülnar 2: Le Trésor de Meydancikkale* [Paris, 1989], pp. 259–322). Hazzard observes that the dated coinage of Coele-Syria provides no support for Davesne's supposition that the succession of different monograms at Alexandria might represent annual magistrates (p. 46, n. 14). More importantly, Davesne's reliance on weight loss as an organizing principle led him to propose sequences in which the royal title and the cult name Soter alternated on the coinage. Hazzard's own view (pp. 30–31) is that the *epiklesis* Soter was too significant to be treated thus erratically. Its introduction was linked to the celebration, about 25 January 262, of the fifth Ptolemaieia, quadrennial funeral games in honor of the dynastic founder. This occasion also marked the commencement of a Soter era (for a full account of the calendrical reform and supporting evidence, see R. A. Hazzard and M. Pim Vatter Fitzgerald, "The Regulation of the Ptolemaieia: A Hypothesis Explored," *Journal of the Royal Astronomical Society of Canada*, 85, 1 [1991], pp. 6–23). Hazzard dates the first use of the epithet Soter to 263/2 but cites no examples. His reference is probably to a tetradrachm of Gaza bearing the regnal year 23 (Sv. 821, see R. A. Hazzard, "Did Ptolemy I Get His Surname from the Rhodians in 304?" *ZPE* 93 (1992), p. 56 n. 35). Hazzard nowhere acknowledges that Mørkholm reattributed this coin, together with related issues of regional mints, to Ptolemy III (O. Mørkholm, "A Group of Ptolemaic coins from Phoenicia and Pales-

time," *INJ* 4 (1980), pp. 4–7). Indeed, Hazzard's allusions (pp. 32 and 80) to this coordinated emission tend to obscure the chronological aspect of Mørkholm's paper. Hazzard is more persuasive when he points to the invariable use of the cult name Soter on dated coins of Coele-Syria from 261/0, and to its continuous appearance in the protocols of legal documents from 259 (p. 46, n. 14). He proposes that tetradrachms bearing the standard Ptolemaic types—that is, the portrait of Ptolemy I and the eagle on thunderbolt—regularly bore the cult name Soter from 261/0 until 199 or slightly before, when the royal title was restored in connection with a reissue of silver octadrachms under Ptolemy V (pp. 34–35).

The reviewer believes that the different average weights of coin issues represented in the Meydancikkale hoard are indeed significant indicators of relative time in circulation, at least insofar as they are based on reasonable numbers of specimens. It appears possible to propose sequences that conform to Hazzard's thesis without flouting Davesne's metrological data. For the Alexandria series, this would mean moving the *pi tau* groups ahead of the tetradrachms with *chi* between the eagle's legs, and compressing the several *sigma* over shield groups to accommodate the *pi-tau* groups in the 260s.

<i>Davesne Chronology</i>	<i>Alternate Chronology</i>	<i>Average Weight in grams</i> [No. of Examples]
<i>Sigma</i> , 277/6–275/4	ca. 277–274	13.957 [78]
<i>Sigma</i> over shield, 274/3–273/2	ca. 273–270	13.993 [53]
— with <i>alpha-iota</i> monogram, 272/1–266/5	ca. 269	14.036 [16]
— with <i>eta-delta</i> monogram, 265/4–262/1	ca. 268	14.082 [18]
<i>Chi</i> between eagle's legs (Soter), 261/0–259/8 (moved later in sequence)		
<i>Pi-tau</i> monogram series, 258/7–253/2	ca. 265–263	14.151 [15]
		14.158 [6]
		14.163 [17]
		14.175 [14]
<i>Pi tau</i> series with royal title, 252/1–250/49	ca. 263/2	14.176 [13]
<i>Pi tau</i> series with Soter, 249/8–247/6	ca. 262/1	14.200 [6]
		14.222 [6]
		14.226 [8]
<i>Chi</i> between eagle's legs (Soter),	ca. 261/0–259/9	— [2]

This reordering keeps the average weights in ascending order. The only actual change of sequence involves the position of the *chi* group, represented by only two specimens in the Meydancıkkale hoard and thus not included in Davesne's metrological calculations. Revising the dates means abandoning the correspondence between the average weights at Tyre and at Alexandria, an assumption that was extremely hypothetical in the first place. The proposed new dates also require us to reject the assumption that weight loss was regular year in and year out. There is an implication of more intense circulation from about 270, a phenomenon that might result if economic growth, well documented in the historical sources, outstripped growth in the money supply. This reconstruction is the more plausible because of the subsequent introduction of large denominations in gold and silver. It is also easy enough to compress Davesne's Cypriote series to keep the royal title before 261/0. Once again this involves renouncing some of his assumptions about the regularity of weight loss over time and across geography, but entails no serious conflicts with his metrological data or other chronological indicators such as die and control links.

The patterns established by Ptolemy II broke up after 241/0 B.C., and it is conceivable that the commitment to propagating the cult name Soter suffered along with other inherited policies relating to the coinage. At any rate, Hazzard's dictum concerning titulature becomes harder to test in the reign of Ptolemy III. There are indisputable counterexamples which must be dated either to the reign of Ptolemy IV or that of Ptolemy V: a brief series bearing the regnal dates 3 and 4, including a *mnæion* with portrait of Ptolemy IV (Sv. 1189) and tetradrachms with the portrait of Ptolemy I and the royal title (Ratto, 4 Apr. 1927, 2903; Sv. 1192; ANS 1944.100.77291). Hazzard's date of 199 or slightly before for reintroduction of the royal title is required by control links—an *alpha-rho* monogram and a spear-head—between Ptolemy I tetradrachms with the *epiklesis* Soter (Sv. 1250) and special tetradrachms for Ptolemy V bearing *his* cult name Epiphanes (Sv. 1249). Hazzard places the deification ceremonies for Ptolemy V in 199/8 (p. 8; the arguments are fully developed in "Theos Epiphanes: Crisis and Response," *HThR* 88, 4 (Oct. 1995), pp. 415–36), and he cannot reasonably retroject the related Ptolemy I tetradrachm by more than about a year.

The complex coinage which can be associated with the Fifth Syrian War includes other instances of the royal title for Ptolemy I. Several of its numerous series display production links, which suggest the following possible order of issue. Mørkholm's sequence in "The Portrait Coinage of Ptolemy V the Main Series," *Essays Thompson* (Wetteren, 1979), pp. 209–14, has been revised to take better account of the links among different series.

LINKED SERIES	NATURE OF LINKS	UNLINKED SERIES
<i>Sigma-omega series (northern)</i> <i>late P IV to perhaps 200?</i> Tyre: P I V, P I (royal and Soter)—Sv. 1177 ff., Sv. 1181, Leu FPL, Winter 1992/3, 96 Sidon: P III, P IV, Sarapis-Isis—Sv. 1184, ANS 67.152.651, Sv. 1186 Ptolemais: P IV, P I—Sv. 1187, ANS 1986.78.105	Obverse die link with unmarked and NI series (early state of die)	<i>Possibly dated mnaeia late P IV?</i> Unc. mint: P III—Sv. 1131–32, of same style as Sidon
<i>Delta-eta series (southern) late P IV to perhaps 200?</i> Ptolemais: P I (Soter)—Sv. 787, Mørk. pl. 23, 18 Joppa: P I (royal)—Sv. 1925 Unc. mint: P I (royal)—Sv. 1135	Undertype for <i>theta-NI</i> coin	<i>Dated civic coinage (southern) 205/4–202/1</i> Ascalon, yr. 1, yr. 3, yr. 4: Sarapis-Isis—Poindessault, 29–30 May 1973, 96 (?); Superior, 10–211 Dec. 1993, 1773; Sv. 1188 Unc. mint, yr. 3, yr. 4: P IV, P I (royal)—Sv. 1189, Ratto Lugano, 4 Apr. 1927, 2903; Sv. 1192; ANS 1944.100.77291
<i>Unmarked series, perhaps ca. 202</i> Unc. mint: Sarapis-Isis,—Ciani, 1925 17 Feb., (Allotte de la Fuÿe) 1705 Unc. mint: P I (royal)—Cahn 80, July 1929, 1218 (?)		

Camp mint?: P IV, A III, P
V—Mørk. XIII

Obverse die link with Sidon and with
NI series (early state of die)

NI series, camp mint, c. 202–200

P IV, A III, P V—Mørk. XII

A: P IV, A III, P V—Mørk. XV

B: P IV, P V—Mørk. XIV

M: P V—Mørk. XVII

H: P V—Mørk. XVI

I: P IV, P V—Mørk. XI

Delta-alpha monogram: P

V—Mørk. X

Theta: P IV, P V—Mørk. IX

CTPA monogram: P

V—Sternberg 26, 16 Nov.

1992, 169

Delta: P V—Mørk. VIII

Sigma: P V—Mørk. VII

Mu-epsilon monogram: P

V—Mørk. VI

All P IV portraits from die earlier
used at Sidon (*sigma omega* series)
and in unmarked series

Reverse die partially erased for M
issue

Overstruck on coin of Ptolemais
(*della-eta* series)

Civic coins with NI (northern)

probably ca. 202–200

Tripolis: P V—Sv. 1296

Berytus: P V—Sv. 1285–86

Tyre: P V—Sv. 1297–98

Single controls, camp mint, ca.
200

M: P V—Mørk. IV and V

Sigma: P V—Mørk. III

Mu-epsilon monogram: P V, P

I (royal)—Mørk. I, Sv.

1264–65

Delta-eta monogram: P V, P I

(royal)—Mørk. II, Sv.

1260–61

Die links with M—NI issue and Sidon

Civic coinage (northern), ca.
200–199

Byblus: P V—Sv. 1288

Berytus: P V—ANS 86'06 (?)

Sidon: P V—Sv. 1294

Dora: P V—Sv. 1262

Obverse die link with M issue

Dated civic coinage (southern)
201/0–200/199

Joppa, yr. 5: P V, P I

(royal)—Sv. 1291, *INJ*

5, pl. 3, 3

Joppa, yr. 6: P V, *INJ*, pl. 3,
2

Ptolemais, yr. 6: PV—

ANSMN 2, p. 8, 6

Unc. mint, yr. 6: PV—

Christie's, London, 9 Oct.

1984, 304

It seems likely that the *sigma-omega* series and the *della-eta* series were to some degree contemporary. Hazzard's thesis would imply that both extended to about 200, when the royal title appears on a dated issue at Joppa. On the whole, it seems safer to reserve judgment until the structure of this coinage can be more securely established, and to consider the possibility that the use of Soter on Sv. 1250 may not mark the end of an established practice, but rather a special case intended to imply a flattering parallel between the dynastic founder and his freshly deified great-great grandson. There is certainly no warrant for dating isolated issues of Ptolemy V, such as Sv. 1254–55 and Sv. 1257–59, on the basis of titulature alone.

The epithet Soter continued to appear after 199 on a series that is the subject of one of Hazzard's principal theses. This series, consisting of dated tetradrachms and didrachms, was fully catalogued by Mørkholm, who attributed the coins to the autonomous city of Aradus, calculated their dates according to the Aradian era, and regarded their Ptolemaic types as merely imitative (O. Mørkholm, "The Ptolemaic Coins of an Uncertain Era," *NNA* 1975–76, pp. 24–46). Hazzard believes that this coinage was instead dated according to the Soter era established by Ptolemy II in 262 (pp. 33–34). The Soter era coinage was not inaugurated until the reign of Ptolemy IV. *Ptolemaic Coins* places the first dated coin in 215/4, but a corrected reading of Sv. 848, accepted by Hazzard in correspondence, puts the first dated issue in 221/0. The undated issue Sv. 853 can now be attributed to the preceding year, the first year of Ptolemy IV. Tetradrachms gave way to didrachms in 171/0, a date which may perhaps correspond to other significant changes in the Ptolemaic monetary system, and from 163/2 the royal title replaced the Soter legend. The Soter era coinage ended in 146/5, with the death of Ptolemy VI on campaign in Syria. It was this invasion, apparently, which introduced so many specimens of the Soter era coinage into Coele-Syria, for Hazzard, unlike Mørkholm, locates the mint within Egypt, probably at Pelusium, site of Ptolemy I's victory over Antigonos the One Eyed in 306.

Hazzard's chronology for this series differs from Mørkholm's by only three years, and most of the evidence supporting Mørkholm applies to the new chronology as well. Martin Price claimed a "clear pattern of

alternation" between coins of Alexander type and the putative pseudo-Ptolemaic issues of Aradus, corresponding to the political situation. However all but one of the political correlations relate to the Alexander coinage, whose era is not in question (M. J. Price, *The Coinage in the Name of Alexander the Great and Philip Arrhidaeus* [Zurich/London, 1991], pp. 416–17). Hazzard's Soter era also yields intriguing correlations with historical events. The series was interrupted very shortly after its inauguration, in 220/19, probably in response to Antiochus III's invasion of Coele-Syria. Suspended again after 208/7, the series was not revived until 193/2, when peace was formalized with Seleucid Syria. It was interrupted yet a third time after 171/0, corresponding to the Egyptian invasion of Antiochus IV, and resumed in 163/2, seemingly upon the restoration of the sole rule of Ptolemy VI. Possible support for Hazzard can be found in one of two hoards published by Arnold Spaer in honor of Mørkholm (A. Spaer, "More on the 'Ptolemaic' coins of Aradus," in G. Le Rider *et al.*, eds., *Kraay-Mørkholm Essays* [Louvain, 1989], pp. 267–73, see especially p. 268). There is a puzzling discrepancy concerning the latest dated coins in Spaer's Dura hoard. The latest Seleucid coins are dated S.E. 147 (146/5 B.C.). But the supposed Aradian series ends with year 117, equivalent to 143/2 B.C. if the date is of the Aradian era. Spaer notes that the discrepancy, together with the surprisingly small number of late "Aradus" issues, might reflect a decreased ability of the hoarder to add to his savings. On Hazzard's dating, the Soter era year 117 is equivalent to 146/5 and the discrepancy simply disappears. It is more difficult to find evidence supporting Pelusium as the mint of this series. To the findspots recorded by Mørkholm we can add still others confirming the same area of circulation. These include the two hoards published by Spaer, both found in the environs of Hebron; the Cyprus 1982 hoard (O. Mørkholm, *NC* 1987, pp. 136–38); the Lebanon 1983 hoard (*CH* 8, 332); and the Syria 1989 hoard (*CH* 8, 462). We must thus regard the attribution to Pelusium as highly tentative and largely unsupported.

Ptolemaic Coins offers a number of minor chronological stipulations and corrections to the dates found in current literature, usually based on the evidence of written documents. Ptolemy II initially counted

the first year of his sole reign (282/1) as his first regnal year, but soon changed the count to begin with his elevation as coregent, so that 281/0 became regnal year 5 (p. 29). His elevation of his illegitimate son to the coregency can now be fixed to the early months of 267 (pp. 30 and 45, n. 11). The Macedonian regnal years of Ptolemy III should be counted from 246/5, not from 246 as in *Gülnar* 2 (p. 47, n. 16). Mørkholm and the late Anne Kromann, *Chiron* 14 (1984), erred in calculating the fourteenth regnal year of Ptolemy V as 192/1; it should be 191/0 (p. 48, n. 29). Hazzard proposes a new solution to the problem of chronology that besets the transition from Ptolemy V to Ptolemy VI. He argues that Ptolemy V elevated his infant son to the coregency in his twenty-fourth regnal year (181/0), and himself died in the course of the same year. Thus the first year of the sole reign of Ptolemy VI (180/79) was reckoned year 2, and on the Macedonian calendar rather than the Egyptian calendar as presumed by Mørkholm and Kromann (p. 48, n. 33). Hazzard also challenges Mørkholm's thesis that Cleopatra VII dated part of her coinage according to the regnal years of her son Caesarion ("Ptolemaic Coins and Chronology: The Dated Silver Coinage of Alexandria," *ANSMN* 20 [1975], pp. 18 and 19). He objects that independent and concurrent dating systems are not attested by surviving documents and would have caused confusion in legal proceedings; he admits, however, that a die study must be the final arbiter on this question (pp. 42–43).

Hazzard's recent articles have touched on many aspects of Ptolemaic coinage as money, including the central role of silver supply in driving monetary reform; the function of bronze as a supplementary store of value, even for the royal accounts; the increasing devaluation of bronze as reflected in evolving silver to bronze exchange rates; the debasement of the silver, which occurred in three distinct stages; the effects of weight loss and speculative demand on actual exchange rates; and the history of the royal finances (see R. A. Hazzard, "The Composition of Ptolemaic Silver," *JSSEA* 20 [1990], pp. 189–97; and R. A. Hazzard, "Two Hoards of Ptolemaic Silver; *IGCH* 1713 and 1722," *NC* 1994, pp. 53–66). In *Ptolemaic Coins*, these same themes are interwoven in an account that emphasizes chronological development over scholarly cruxes. Hazzard's overview is appealing because

he interprets the evidence to support an elegantly simple series of adjustments, whereas earlier scholarship, once past the reign of Ptolemy III, has offered conclusions so convoluted as to be nearly incomprehensible to readers and historically improbable as the basis for a national economy.

The most important new material here concerns reforms under Ptolemy IV and VI. The well-known papyrus *UPZ* I 149, line 32, implies an exchange rate of 1 silver stater (tetradrachm) for 16 drachms 5 1/2 obols in bronze. Hazard interprets this document as evidence for a four-fold devaluation of bronze currency early in the reign of Ptolemy IV, on the assumption that the same transaction had previously involved an exchange at the rate of 1 to 4 plus *agio* (p. 82). The subsequent introduction of the so-called copper standard in 210 involved a conversion factor of 1 to 60, calculated from the cost of unskilled labor, which is assumed to have remained stable between 257 and 209/8 (p. 96, n. 52, citing *PSI* 4.332, line 10, one obol per day, and *O. Mich.* 1.1, line 7, 10 copper drachms per day). Thus the old bronze obol became 10 new copper drachms, and the old bronze drachm became 60 new copper drachms. Taking into account the previous devaluation of the bronze currency, the silver tetradrachm now exchanged for a bit over 1000 copper drachms. *P. Tebt* 3² 891 attests to the same rate for the early years of Ptolemy VI, while *UPZ* 1.88 (161 B.C.) and 1.93 (159 B.C.) point to a rate of 1 to 2,000. Hazzard suggests a date around 170 for this second devaluation of the bronze currency (p. 85).

Another highly interesting feature of *Ptolemaic Coins* is Hazzard's speculative reconstruction of the bronze currency system of the early Ptolemies (pp. 64–67). Following J. G. Milne, he suggests that the bronze coinage of Ptolemy I after ca 295 was based on a bronze obol of about 16 g and a bronze hemiobol of about 8 g. Ptolemy II expanded the range of denominations to include a bronze drachm of about 96 g to replace the silver drachm which was no longer being struck, and a bronze hemidrachm of about 48 g. Later in his reign Ptolemy II reduced his bronze weights by 25 percent, yielding a bronze drachm of about 72 g and a bronze obol of about 12 g, with a range of other bronze denominations corresponding to common silver fractions of the Attic divisional system. The expanded denomina-

tional system of Ptolemy III conforms to the same weight standard, as does the bronze coinage attributable to the earlier reign of Ptolemy IV. Hazzard cites a bronze of Ptolemy IV, with four pricks in the field, which conforms to his theoretical tetrobol weight and was apparently used as a counter in exchange (pp. 65–66). A second bronze weight, also apparently from the time of Ptolemy IV, weights 80.14 g and is marked with a letter *sigma* representing the Greek numeral 200. It implies that at some date after the introduction of the new system of reckoning, the old bronze drachm of about 72 g was worth 180 copper drachms (p. 67). A parallel corollary, not stated by Hazzard, is that the 60 copper drachm coin, equivalent to the bronze drachm on the silver standard of reckoning, had been reduced in weight to about 24 g.

Hazzard's views on the bronze denominations of Ptolemy III appear to be part of an emerging consensus, for several others have independently arrived at similar conclusions. Veronique van Driessche worked out a series of theoretical weights for the bronzes of Ptolemy III based on a unit of about 72 g and noted that the divisions were identical to those of the Attic currency system (V. van Driessche, "A propos du monnayage des Ptolémées au III^e s. av. J.-C.," *RevArchHistArtLouvain* 21 [1988], pp. 60–74). In the new Cologne catalogue, Wolfram Weiser assigns names to the bronze denominations of Ptolemy III which are consistent with Hazzard's system (see below). And the reviewer, following a line of reasoning proposed by Georges Le Rider and based on silver to bronze ratios, hit upon the same denominational system for Ptolemy III in correspondence with Le Rider.

The case for the "heavy standard" and a reduction under Ptolemy II may be more problematic. The reformed bronze coinage of Ptolemy II comprises eight denominations. Hazzard's system assumes that two denominations were struck on the heavy standard and exchanged with earlier coinage still in circulation, whereas the other six were struck only after reduction of the weight standard. The control system does not support such a distinction. The purported drachm of about 96 g occurs unmarked, or with control letters *epsilon*, *theta*, *lambda*, and perhaps *sigma* (Sv. 412, 446, 462, 478, and 502a—the last, known from a single recorded specimen, must represent an exceptionally small emission). Denominations allegedly belonging to the

light standard share the same control system, though they also occur with other control letters, the most common being *alpha*, *della*, *rho*, and *tau*. There are no countermarks to signal a possible revaluation of the large bronzes of 96 g and 48 g, and they were not removed from circulation, as the hoard record demonstrates. In fact, hoard specimens of the largest bronze denomination generally show wear comparable with smaller denominations struck under Ptolemy III (see E. T. Newell, *Five Greek Bronze Coin Hoards*, NNM 68 (New York, 1935), 1, 8–20, and 29, with commentary on pp. 58–59, where stylistic considerations are also cited; M. J. Price, “The Coins,” in *The Anubieion at Saqqâra 1: The Settlement and the Temple Precinct* [Egypt Exploration Society, 1988], 10–34, 218–219, 355–356). Of the four sizable issues of this largest bronze, only one—the issue marked with *theta*—is not thus associated with bronzes of Ptolemy III. Untidy as it may seem, the hoard evidence suggests that three issues of the supposed heavy drachm (unmarked, *epsilon*, and *lambda*) were struck under Ptolemy III, leaving only the *theta* and the insignificant *sigma* emissions for Ptolemy II. One solution to the dilemma is to assume several changes of weight standard to accommodate different patterns of emission. The more economical approach would be to assume that the largest denomination, struck only occasionally, represented an octobol based on a drachm of about 72 g.

In the chapter on Ptolemaic portrait coins, Hazzard offers several new identifications. The common Syro-Phoenician bronzes in the name of Queen Berenice (Sv. 1047–57) are attributed to the reign of Ptolemy II and their portrait identified as that of his mother Berenice I (p. 2). They are thus brought into relationship with the Judaeian silver minimae honoring the Theoi Soteres Ptolemy I and Berenice I. The new interpretation is preferable to that of Svoronos (Berenice II, reign of Ptolemy III) which implies two different official portrait types for Berenice II. Hazzard’s reattribution is also supported by Svoronos’s own comment that these bronzes lack the central cavity, whose introduction is now placed in the reign of Ptolemy II. A more daring reattribution involves the Attic-weight gold and silver in the name of Queen Berenice. Citing Polyaeus 8.50, Hazzard reminds us that the invasion of Syria by Ptolemy III involved a concealment of his sister’s death and the amassing of 40,000 talents. The Attic-weight coinage,

he contends, was struck by the invader in the name of Berenice, widow of Antiochus II (p. 5). Readers must consult the endnotes to discover Hazzard's opinion that the regular Ptolemaic-weight coinage for Berenice was also struck posthumously for the Syrian queen (p. 20, n. 16). Hazzard follows Newell, Kyrieleis, and Smith in treating Sv. 894 as a portrait of Ptolemy III (p. 6, fig. 9). Nowhere does he acknowledge that this passage might be somewhat controversial. Svoronos believed the coin an issue of Ptolemy II, struck at Ephesus in 266 with his own likeness. Davesne has challenged the Ephesian attribution, suggesting Aradus instead, but accepts the portraits as likely of Philadelphus (A. Davesne, "Les monnaies ptolémaïques d'Ephèse," *Erol Atalay Memorial* [Izmir, 1991], p. 27). Further confusion could arise from the fact that Hazzard associates this tetradrachm with a series of bronzes with the laureate bust of Ptolemy III (Sv. 997-1000), which however have their own portrait tetradrachm (Sv. 996). A fourth reattribution with interesting ramifications involves the unique portrait tetradrachm of Ptolemy VI in the American Numismatic Society (D. Kiang, "An Unpublished Portrait of Ptolemy VI Philometor," *ANSMN* 10 [1962], pp. 69-76). Hazzard recognizes instead a posthumous portrait of Ptolemy V (p. 9). The winged thunderbolt tetradrachms of Ptolemy V include two stars on the reverse. Hazzard interprets them as symbols of two comets, one visible at the birth of Ptolemy V and the other at his accession, which were interpreted as signs sent by Zeus in token of his divinity (p. 8 with n. 21). Another example of the cultural significance that Hazzard finds in iconography is his association of the caps of the Dioscuri, which appear on the reverse of the gold double octadrachm of Arsinoe Philadelphus, with a passage in Callimachus describing her soul conducted to heaven by the Twins after her death (p. 4). Elsewhere, Hazzard attempts to generalize this symbolism, suggesting that the pilei on other coins could allude to the deaths of Berenice of Syria (p. 107) and Cleopatra I (p. 113).

The University of Cologne's Institut für Altertumskunde has a fine small collection of Ptolemaic and related bronzes, totaling 188 pieces. The primary goal in publishing any collection is to provide an accurate and useful record of its contents, and in this respect Wolfram Weiser has succeeded admirably. The illustrations, based on photographs by

Weiser himself, are first rate. The technical data for each coin include a measure of thickness as well as the diameter, weight, and die axis. The type descriptions, including hand-drawn monograms where needed, are reliable overall. There are a couple of minor lapses: 9 is described with a palm branch in the field, whereas the commentary refers to a grain ear; 45 and 46 appear to have had their descriptions interchanged, although the references match the illustrations. The cross-referencing aspires to be comprehensive, and common coins sport lengthy citations, beginning of course with Svoronos and other standard catalogues, but also including hoard publications, excavation reports, Szaivert and Sear's popular handbook, and selected auction catalogues. Here, again, there are a few typos: for 2, the Svoronos reference should read 75, not 78; for 12, the *SNGCopenhagen* reference should read 129, not 1290.) The Saqqâra excavations were overlooked, with possibly significant consequences discussed below. No provenances are provided for the coins. Weiser has appended interpretive remarks to only a few of the entries, neglecting some issues that might have benefited from his commentary.

The Cologne collection includes a number of unpublished items, including some entirely new varieties and unrecorded countermarks. Arguably the most important is coin 1, weighing 2.56 g, with a leaping animal on the obverse (described as a gazelle in the catalogue, but perhaps really a ram) and on the reverse a balance scale with three pellets. Regrettably, Weiser offers no commentary to justify either his doubtful attribution to Nectanebo II, or his tentative identification of the piece as a tetartemorion weight. Apart from its presence in the Cologne collection, there are no obvious indications of an Egyptian origin for the weight. Marks of value normally indicate that a coin is a multiple of some smaller unit. It would thus be natural to ask whether this weight could be understood as a trichalkon on the Attic system, implying a bronze obol of 6.824 g and a bronze drachm of 40.944 g, or as a tetras/trionkion on the Sicilian system, implying a litra of 10.24 g. Though made of bronze, the weight could have been used in weighing precious metals, in which case it might be a triobol weight, implying a stater of 10.24 g. Quarter staters of this weight were indeed struck in the second half of the fourth century at Abdera and Maroneia.

A second most intriguing novelty is 47, a bronze of 10.32 g with the types of Arsinoe Philadelphus and control letter *theta* behind the head. The description gives a date around 253/2. Presumably this is based on Troxell's chronology for the Arsinoe silver decadrachms and gold *mnaeia*, which is supported by the form of the calyx ornament at the tip of the cornucopiae (H. A. Troxell, "Arsinoe's Non-Era," *MN* 28 [1983], pp. 35–70, see especially p. 47, fig. 1.3). There is a Cypriote bronze, 125, with standing Aphrodite reverse (Sv. 1006) counter-marked with an *alpha-rho* monogram which Weiser associates with the similar control on Tyrian bronzes (Sv. 1251), concluding that the countermark was applied at Tyre ca. 202–200. The Cologne collection also provides two new denominations marked with this same control, 119 and 124, the former bearing a Phrygian cap instead of the Tyrian club and attributed by Weiser to Joppa.

The most remarkable feature of the Cologne catalogue is that the coins are classified according to a complicated metrological theory. The catalogue headings indicate both frequently changing bronze weight standards and somewhat less frequent adjustments in the exchange rate between silver and bronze coinage, while the entries give a denominational name to every coin. In his foreword, Weiser explains that these constructs are the result of a collaboration between himself and the papyrologist Klaus Maresch. The rationale for Weiser's mint attributions, chronology, and interpretation of the denominations is promised for a forthcoming monograph that will cross-reference the Cologne catalogue (not yet available, according to a recent communication from the publisher). Maresch's study of the relevant papyrological evidence appears in a separate volume (K. Maresch, *Bronze und Silber: Papyrologische Beiträge zur Geschichte der Währung in ptolemäischen und römischen Ägypten bis zum 2. Jahrhundert n. Chr.*, Nordrhein-Westfälische Akademie der Wissenschaften Sonderreihe Papyrologica Coloniensa 25 (Opladen 1996)). Clearly we cannot assess Weiser and Maresch's contribution without all three publications in hand. It is troubling that their results are prematurely enshrined in the Cologne catalogue, as if they were already generally agreed upon. The catalogue will introduce their ideas to an uncritical audience in commercial numismatics, and perhaps expose them to unwary scholars in related fields of study. Meanwhile, scholarly

review will occur in less visible publications, and corrections or disagreements will never catch up with the original broadcast.

Even at this preliminary stage it is evident that Weiser and Maresch's theory is formidably complex, in contrast to the seductive simplicity of Hazzard. Three are areas of agreement, however, principally in the reconstruction of the bronze denominational system of the early Ptolemies. Weiser, like Hazzard, identifies the common 16–18 g bronze of Ptolemy I as equivalent to a silver obol (4–6), and finds the related bronze drachm in the largest denomination of Ptolemy II's reformed coinage (19–21, with theoretical weight 106.8 g, as opposed to Hazzard's "ideal weight" of about 96 g). Both Weiser and Hazzard posit a subsequent reduction of the bronze drachm to about 72 g, dated to 256 in the Cologne catalogue (p. 40). Like Hazzard, the Cologne catalogue assumes an exchange rate of 1 to 60 between the silver drachm and the so-called copper drachm of reckoning. But as we have seen, Hazzard's calculation factors in a previous devaluation of bronze by Ptolemy IV, shortly before the introduction of the copper standard of reckoning in 210. Weiser and Maresch apparently assume the 1 to 60 exchange rate for the entire third century, for the catalogue inexplicably notes values in terms of copper drachms of reckoning throughout, even for coins of Ptolemy I (p. 20, 4–6). There is again agreement about an exchange rate of 1 to 120 in the second century, though Hazzard sees it as a permanent fixture from ca. 170, whereas the Cologne catalogue places its introduction in 183/2 (p. 82), followed by a brief revival of the 1 to 60 rate ca. 176–170 (p. 92), then a reversion to 1 to 120 from 168 to 127 (p. 99), with a final inflation to 1 to 240 (pp. 100 and 111).

The obsessive repetition of Ptolemaic coin types ensures that there will always be disagreements among specialists regarding chronology and mint attribution. But because a sound chronological arrangement of the material must be the basis for any metrological theory, Weiser's chronology may merit special scrutiny. His chronology for the major Alexandrian bronze series of the third century is an important case in point. It differs from that proposed by E. T. Newell based on wear and stylistic analysis of hoard coins ("Hoard of Ptolemaic Bronze Coins," in *Five Greek Bronze Coin Hoards*, NNM 68, pp. 51–67). It is somewhat closer to that proposed by Paolo Visonà based on study of a

hoard in the J. Paul Getty Museum, "A Hoard of Ptolemaic Bronze Coins in the J. Paul Getty Museum," *JPGMJ* 6-7 (1978-79), pp. 153-62.

<i>Weiser</i>	<i>Newell</i>	<i>Visonà</i>
71.2 g standard, 256-222 B.C.		
<i>Delta-iota</i> series (Sv. 1125-28)	Ptolemy IV	Ptolemy IV
Ptolemy III		
<i>Sigma</i> and <i>sigma-epsilon</i> series (Sv. 992-93)		Ptolemy IV
Unmarked series (Sv. 1002-04)		Ptolemy III
<i>Chi-rho</i> series (Sv. 964-71)	Ptolemy III	Ptolemy III
Ptolemy IV		
<i>Lambda</i> series (Sv. 1166-71, 1173)	Ptolemy III	Ptolemy IV
<i>Epsilon</i> series (Sv. 974-77)	Ptolemy III	Ptolemy IV
Ptolemy V		
<i>Sigma-epsilon</i> series (Sv. 1148, 994)	Ptolemy IV	Ptolemy IV

Weiser's sequence is improbable in view of the die links recorded by Visonà within the *delta-iota* series (Sv. 1126) and within the *sigma-epsilon* series (Sv. 992), which he reasonably took as evidence that these two series were the latest in the Getty hoard. Weiser also ignores the evidence of the Anubieion hoard found in the Saqqâra excavations, as presented in Price's publication of the excavation coins. The Anubieion hoard had a generally similar content to the Newell and Getty hoards, but with an earlier closure. Price, like Newell, used control links with the precious metal coinage to establish the following sequence.

	<i>Anubieion</i>	<i>Newell</i>	<i>Getty</i>
Ptolemy III			
Unmarked series	Sv. —		Sv. 412, 1002, 1172
<i>Epsilon</i> series	Sv. 446, 974	Sv. 446, 974	Sv. 446, 974-75
<i>Lambda</i> series	Sv. 478, 1166-67, 1169	Sv. 478	Sv. 1166-67
<i>Chi-rho</i> series		Sv. 964-65	Sv. 964-66
Ptolemy IV			
<i>Sigma-epsilon</i> series		Sv. 992	Sv. 992-93, 1148, 1168
<i>Delta-iota</i> series		Sv. 1125-26, 1128	Sv. 1125-28, 1130

Doubts about Weiser's chronology may well undermine our confidence in Weiser and Maresch's reconstruction of the history of the

bronze weight standard, which (according to the headings in the catalogue) involves a theoretical drachm weight of 71.2 g from 256 to 222 (p. 40), a reduction to 64.1 g for the reign of Ptolemy IV (p. 58), and a further reduction to 53.4 g in the first years of Ptolemy V (p. 64).

The Saqqâra excavations also raise questions about Weiser's chronology for the remaining Ptolemy V coinage. He dates the Sv. 1491 series to about 200–197, positing a brief phase when the bronze drachm had a theoretical weight of 26.7 g. The series distinguished by handsome Isis heads (Sv. 1233–40) follows ca. 197–183/2, when the weight of the bronze drachm purportedly rose to 35.6 g. Yet no less than five hoards found at Saqqâra containing the Sv. 1491 series show that it circulated alongside the double eagle types Sv. 1423 and 1424, whereas no coin from the Sv. 1233 series is represented (M. J. Price, "Appendix J: Coins," in *The Sacred Animal Necropolis at N. Saqqâra* [Egypt Exploration Society, 1981], pp. 156–59). This consistent evidence not only suggests that Weiser has the sequence wrong (the Isis heads probably preceded the Sv. 1491 series) but perhaps even that the Sv. 1233 series had been withdrawn from circulation. Once again there may be metrological conclusions riding on the chronology. The catalogue headings indicate a series of changes in the weight of the bronze drachm under Ptolemy V.

Weiser Chronology

ca. 204–202, 53.4 g

ca. 202–200, 35.6 g

ca. 200–197, 26.7 g (Sv. 1492–94)

ca. 197–before 183/2, 35.6 g (Sv. 1233–39)

Sequence Implied by Saqqâra

Sv. 1491–93 later than Sv. 1233–40

Sv. 1233–40 earlier than Sv. 1491–93

The Saqqâra evidence may point toward a simplification, with a drachm of about 36 g through most of the reign of Ptolemy V, reduced to about 27 g toward the end of the reign.

Countermarks are another phenomenon with possible chronological implications. A cornucopia countermark in rectangular punch appears on 140, a bronze of 44.45 g with the *sigma-epsilon* monogram which Weiser dates ca. 204–202. The episode of countermarking is attributed to Alexandria "before 180" — "before 176/170." This corresponds to the period of one of Weiser and Maresch's weight standards based on a drachm of 26.7 g represented by the common double eagle

bronze with cornucopia in left field (Sv. 1424). Newell already noted the frequent occurrence of the cornucopia countermark on the *sigma-epsilon* series and related issues (Sv. 1140, 1142, 1144) to support his attribution of the *sigma-epsilon* series to Ptolemy IV ("Hoard," p. 64). We can buttress his argument by citing a few specimens of the *delta-iota* series with the same cornucopia countermark (Sv. 1125, specimen *kappa*; Sv. 1127, in a private American collection). There are no later instances of the cornucopia countermark except, ironically, on coins from one of the North Saqqâra hoards weighing about 18–22 g (Sv. 1375 and a similar type not recorded by Svoronos, with helmet in left field, see Price, p. 159). These data suggest that the cornucopia countermark was actually applied in two different episodes, once on the *sigma-epsilon*, *delta-iota*, and related series, in the reign of Ptolemy IV or early in the reign of Ptolemy V, and again not long before the introduction of the common double eagle type Sv. 1424. Because countermarks could, among other things, indicate the revaluation of a coin, Weiser's transposition of the earlier episode to the later period deprives him of possible evidence relating to metrological reforms under Ptolemy IV and/or V, and may misrepresent the circumstances of a later reform as well.

Weiser is occasionally insensitive to a stylistic feature with chronological implications. The Ptolemaic eagle is shown with bare legs on tetradrachms of Ptolemy IV. The tufts of feathers at the tops of the legs become more flowing on the Alexandrian silver of Ptolemy V. Bronzes inscribed for the regency of Cleopatra I demonstrate that at Alexandria, the eagle's legs were depicted entirely covered with feathers as early as 180–176. The same type consistently appears on the dated tetradrachm series beginning in 155/4, and this stylistic feature is the principal criterion for assigning common undated tetradrachms and didrachms to Ptolemy VI rather than Ptolemy V. But in Cyprus, dated tetradrachms of the joint reign of Ptolemy VI and VIII still display the bare-legged type. The new style eagle with feathered legs was phased in on dated Cypriote tetradrachms between 163 and 160. It seems reasonable to assume that the same models were employed for contemporary bronze coinage. Thus Weiser is almost certainly mistaken in dating Cologne 70, a Cypriote bronze with lotus blossom symbol and the eagle's legs fully covered with feathers (Sv.

1403), to the reign of Ptolemy III. It probably belongs to the reign of Ptolemy VI after 163. Conversely, 174, a bronze with Alexander head in elephant headress and a barelegged eagle, is doubtfully attributed to Ptolemy X though it appears to be an ordinary example of Sv. 1493; a very similar coin appears as 128, given to the reign of Ptolemy V and dated ca. 200–197. The second of these misattributions has no apparent bearing on the metrological theory of Weiser and Maresch, but the first may. Coin 70, with weight of about 92 g, is described as a drachm struck at Alexandria on the Attic standard for circulation in Cyprus. To what degree did this misattribution contribute to the conclusion that Cyprus employed a different weight standard from Egypt during the third century? To what extent did it affect the determination that the weight standard in place after 163 was based on a bronze drachm of 53.6 g?

A few more problematic entries must be mentioned because they conflict with published interpretations of archaeological evidence, though not all of them bear on the chronological theory. Portrait bronzes of Ptolemy III, 68 and 69, are attributed to the Alexandria mint in 245 B.C. The references cited include the Corinth excavation report, but not Tony Hackens, who identifies the issue as a donative to Sparta ca. 227–223 (T. Hackens, "A propos de la circulation monétaire dans le Peloponnèse au III^e siècle av. J.-C." *Antidoron Peremans*, *Studia Hellenistica* 16 [1968], pp. 82–85). Late Ptolemaic bronzes attributed by Weiser to Alexandria, 167–73, were reattributed to the Cyrenaica by T. V. Buttrey based on abundant finds in various Cyrenaican excavations; his forthcoming book on the coins from the Demeter Sanctuary excavations at Cyrene not only confirms the earlier reattributions, but points to Cyrene as the mint for 164–66 as well (T. V. Buttrey, "Roman Coinage of the Cyrenaica," in C. N. L. Brooke *et al.*, eds., *Studies in Honour of Philip Grierson* [Cambridge, 1983], p. 23, n. 1; T. V. Buttrey, *The Extramural Sanctuary of Demeter and Persephone at Cyrene, Libya—Final Reports* (University of Pennsylvania Press, in press). A bronze inscribed for Cleopatra VII and Mark Antony (188, Sv. 1899), is described by Weiser as a semis or hemiassarion struck in the field by Antony at Patrae. Yet Buttrey has called it an as and has reaffirmed Svoronos's attribution to the Cyrenaica (Buttrey, *Studies Grierson*, pp. 26f and 34; Buttrey, *Demeter*

Sanctuary, 742 with n. 64). *Roman Provincial Coinage*, which Weiser cites as a principal reference, follows Buttrey in these matters. In the last example, at least, Weiser knew the relevant literature but disagreed with its conclusions—a note of explanation would have been helpful.

The reservations expressed above are not intended to damn an excellent work, but rather to suggest that the Cologne catalogue—like every collection catalogue—should be employed judiciously. It is an authoritative presentation of primary sources, and as such it is enduringly valuable. But it should not become a quick reference for dates, mint attributions, or especially denominations, which are subject to revision by future scholarship. These particulars are best researched in different studies, such as the associated monographs by Weiser and Maresch.

This is an immensely stimulating pair of books, and it is gratifying to know that further serious discussions are on the way. To all appearances, we are entering a very fruitful period in the study of Ptolemaic coinage, potentially one of the most interesting of Greek antiquity.

CATHARINE C. LORBER
Woodland Hills, CA

FRANK BERGER, *Die Münzen der Römischen Republik im Kestner-Museum Hannover*. Hannover: Kestner-Museum, 1989. 539 pp., illus. ISBN 3-924029-12-1. No price stated.

In 1871 Max von Bahrfeldt bought his first Roman coin—the start of a collection that was destined to grow for 48 years. It was a good time to begin. Although his collection was not auctioned until 1881, Borghesi had died in 1861, followed by d'Ailly in 1877 when Bahrfeldt was 21. Naturally there was always competition from other collectors and institutions for Republican coins of the highest quality in silver and gold, but Bahrfeldt's main interests lay elsewhere. He sought silver issues that were wholly anonymous or bore only symbols, letters, or monograms, and all struck aes—two areas that were much less in demand with the passing of Borghesi and d'Ailly, and more

affordable for a military officer. But his greatest collection was information.

Stimulated by his father-in-law Samwer, he became a serious and careful student of Republican coinage. He assiduously sought data on specimens of most issues, both by tours of museum and private collections and by correspondence. Beyond recording data, moreover, Bahrfeldt made casts of interesting coins which, added to those received by post from inaccessible collections, enabled him to amass a visual database greater than any single collection of coins. This helped him discern more clearly than his predecessors and contemporaries the details and relationships of many issues, which he published in a stream of articles from 1874 to 1934.

Bahrfeldt's knowledge no doubt enabled him to make his collection of coins a formidable one, but his friend Otto Hager also played a vital role in the formation of the Kestner Museum collection. A wealthy businessman in retirement, Hager bought Bahrfeldt's collection in 1919, added it to his own, and then sold both in 1925 to the Kestner, to which he had previously made donations. Since Hager had obtained coins from Bahrfeldt before 1919 (e.g. the quadrans in *NZ* 51 [1918], p. 133, col. 2, no. 2 = 2472), it is impossible now to distinguish their collections. Nevertheless one can safely say that the Kestner collection is the product of Bahrfeldt's knowledge, Hager's wealth and acumen, and their close friendship.

Dr. Berger must be thanked for illustrating virtually all the coins, which cover the full range of Republican coinage from ca. 300 to 31 B.C. Among the 3,953 coins only about 20 anonymous *Æ* are unillustrated. Since many issues are represented by multiple examples, the author faithfully adheres to Bahrfeldt's emphasis on recording and seeing as many examples as possible. The reader is further helped by the occasional sacrifice of space to keep all examples of an issue on the same page. Each piece is listed with its Crawford number, weight, die axis, and Hannover inventory number, and the coins are ordered following Crawford's chronology. The photographer has shown as much detail as possible, and the pictures are sharp. In fact many of the coins are more attractive than they appear in the plates, as evidently the eye passes over microscopic damage that the camera

refuses to ignore. For aesthetic reasons alone a trip to Hannover would repay the effort.

This catalogue is uniquely valuable in three areas of republican coinage. First, until the collections in the Museo Capitolino, the Museo Civico di Torino, the Bibliothèque Nationale in Paris, or a few other museums are published with full illustration, this is the only catalogue where one can see virtually all issues of struck Æ, including most denominations. For example, perhaps you need to compare the Æ issues with thunderbolt and helmet (C. 119, 118). Previously you would have had to visit one of the abovementioned museums or trust the not-always-trustworthy drawings in d'Ailly, *Recherches sur la monnaie romaine* (Lyon, 1864–69). Here 1334–39 present three asses, three semisses, and a sextans with helmet, and 1345–51 all denominations, as to uncia, with thunderbolt. Are the heavy and light series with apex and hammer (C. 59), caduceus (C. 60), and Victory (C. 61) contemporary? Crawford says they are, basing this surprising conclusion on one obverse die identity (*RRC*, p. 13). The key coins are in Hannover. The dies of 813 and 814 seem to be identical, but whether 814 belongs with the light series seems uncertain: is it light or heavy? Republican Æ weights are highly variable and 814 is too corroded to support Crawford's conclusion by itself. More evidence is needed.

C. 97, with ♀, is a confusing issue of 25 denominations divided in *RRC* into six insufficiently defined groups, illustrated by 13 photos. At last some help has arrived: 1082–1125 and 3873–75 show 47 examples covering 19 denominations. D'Ailly made a noble start on the anonymous Æ, but much remains to be discovered. For example, C. 56 is an agglomeration of anonymous Æ probably (to judge from differences of style and weight) comprising several issues. *RRC* generously shows 20 examples, and 76 more are shown here. Note that 597 is identical in style to Æ with club (e.g. 1048) and thus is probably contemporary. Also the dies of 662 are unlike those of *RRC*, pl. X, 23, so these two trientes represent an issue of crude dies rather than one engraver's misadventure. Are they possibly unofficial imitations? Taken together, *RRC* and Grueber's *Coins of the Roman Republic in the British Museum* (London, 1910) provide extensive illustration, but the student will find here, issue after issue, similar breadth and much greater depth.

A second unique feature of this catalogue stems from Bahrfeldt's interest in variants in metal, style, and legend. The former begin with 3886–3907, hybrid denarii. Most are plated, perhaps all, since Dr. Berger informs me that those few not described as plated looked like good silver but have not been analyzed. It is instructive to note the range from official (3890) to crude (3886) style. Following the hybrids are coins in copper or lead (3908–52). With one exception, a gross imitation of C. 149/1a, these are probably cores of plated denarii. A comparison of 3918 and 3923, for example, to strikes from genuine dies with the same control marks shows them to be from different dies.

Most of the variants in style and legend will also be found in this collection, quite a few having been discovered by Bahrfeldt himself. What does a butterfly and grapevine as look like without the grapevine? See 1782. Or an as of Q. Marcius Libo without LIBO? See 2035–36. Crawford divides the denarii of C. 162 into two varieties, based on the presence or absence of a crossbar on A; 1625–29 and 1679–81 illustrate not only these varieties but a third, lacking T. More importantly, one can note the wide variation in quality of obverse die engraving. Can 1625 and 1626 have come from the same mint? The similarity of reverse dies leads me to agree with Crawford that they did, and provides a cautionary lesson in the use of style for classification.

Another instance of the value of publishing such a wisely selected collection is C. 93, divided by Crawford into large and small head varieties. Coins 1055 and 1062 do have large heads, and 1058 a small one; but 1055–62 taken together show a fairly continuous range of head sizes. Let the reader decide if a distinct division exists. As a last example, there are many varieties of C. VIBIVS PANSA asses, C. 342/7. *RRC* illustrates one, but one can better appreciate this issue by seeing 20 examples, 2974–93, which cover most of the variations in style and legend.

From the issue of Q. MAX (C. 265, ca. 127 B.C.) down to ca. 25 B.C., only one large issue of Æ fractions, C. 339, was officially coined. But there is a considerable body of Æ, usually called unofficial imitations, which was probably produced during this dearth of official Æ fractional coinage (see *AJN* 29 [1982], pp. 139–64).

Indeed most of C. 339 are anonymous quadrantes whose styles vary so much that Crawford states that they themselves might be unofficial imitations (*RRC*, p. 340). These variations interested Bahrfeldt (see *BMzfr* 69 [1934], pp. 108–12) and are well represented here (2721–2870). The two factors, not always both present, that distinguish this coinage are a cruder style and the minting of only one denomination. Most of the issues are scarce, but the semisses with dolphin (2799–2812) and (2834–37) are often found in Italy, while anonymous semisses similar to 2725, 2727, 2729, 2744, 2755, and 2758 are common in Spain. These unofficial issues probably provided a considerable part of the fractional *Æ* in circulation.

The third area of strength of the Kestner collection is the *Æ* coinage with letters, symbols, or no markings at all. Nearly every issue is here, most in multiple examples. *RRC* notes only nine denarii with helmet, yet there are six here plus three more from a die with an incomplete helmet facing left (1666–68). There are three denarii with ear, two with wing, and six with pentagram. Or one can study the rare victoriatu with torque, four with *CROT*, nine with *Q*, and six with club. And on and on. Few of the *Æ* are in superb condition, but nearly all are quite clear, so one can compare dies or study details of the designs. The wealth of data and photos here surpasses any other museum catalogue and invites other celebrated museums to publish their holdings.

There are two areas of the collection which are not strong. The *Æ* coinage after ca. 150 B.C., while decently represented, does not equal the previously published collections and sale catalogues that one may easily consult. And the aes grave, consisting for the most part of a group bought in 1986, are generally in low grade. There are no rarities and some are of doubtful authenticity.

The appended list of comments and corrections is offered with a view to enhancing the utility of this splendid catalogue. The comment “uncertain” without further explanation means that I was unable to attribute the coin due to damage or wear.

25. Excluded from *RRC* due to retrograde obverse legend. Apart from the legend, however, the coin seems perfectly normal. Since legend variations occur occasionally in Republican

coinage (e.g. C. 341/6, 494/39, etc.) this is probably just another variant of C. 17. In *RRC*, p. 565, 306, another example is noted in Munich.

27–28. Uncertain varieties.

204. The rostrum tridens is bizarre. Possibly false?

208. Whoever engraved the deckhouse on the reverse had no idea what it should look like. Possibly false?

210. The head of Janus is crude and the prow cursory. Possibly false?

260, 263. Uncertain.

266–69. Should be C. 72/7.

278. Should be C. 43/3a; delete “Dieses Exemplar.”

288, 290, 294–95, 304. Should be C. 75/1c.

309. Should be C. 46/1.

329, 351, 373. Should be C. 47/1a.

336, 346. Should be C. 98B/1.

347. Should be C. 45/2.

349, 352. Should be C. 68/2b.

370–72. Should be C. 102/2b.

402. Should be C. 83/1b.

418, 429, 450, 459–60, 472, 477. Should be C. 70/1.

447. Should be C. 67/1.

476. Should be C. 166/1.

400–479. Berger has not tried to separate the anonymous victoriati into C. 44/1 and 53/1, with some justice since Crawford does not clearly explain the difference. Some of these have been reassigned in the three preceding comments. My tentative classification of the rest is 401, 405, 409–10, 414, 416, 436–40, 443, 448–49, 453, 457–58, 463–64, 469–70, 473, and 478–79 belong to C. 53/1. C. 44/1 is left with 400, 403–4, 406–8, 411–13, 415, 417, 419–28, 430–35, 438, 441–42, 444–46, 451–52, 454–56, 461–62, 465–68, 471, and 474–75.

483, 485, 495. Should be C. 54/1.

493. Should be C. 167/1.

502. Probably an imitation.

503. Should be C. 198/1.

593. Assuming that the weight is 33.34 g, this worn semis should be C. 41/6e.
751. An imitation. Both the obverse and reverse styles are wrong: note, for example, the obverse hair and the horses' rear legs.
776. Probably belongs with the unofficial imitations, 2787–2870.
- 826h. Should be C. 56/4, an anonymous triens of a style similar to 645.
851. I have seen another C. 68/3 in trade, so it is not unique.
878. There is a semicircle behind the head which is joined to a hair curl. Thus it can equally be interpreted as one (unusually) long curl or a **C** linked to a curl by engraver's error. Without any other clear example known to me, I prefer the latter interpretation and question the existence of C. 71/1c.
- 893–94. Should be C. 69/5.
- 895, 897. Should be C. 42/3.
- 941–8. Should be C. 53/2.
973. False. All sestertii I have seen exhibit the same style as the denarii and quinarii of this issue. This coin has a different style helmet, cape and monogram placement. Moreover, upon viewing, the monogram appears to be cut into the coin, which may have originally been an anonymous sestertius of the style of 359.
997. There is an **H** before the prow, probably an accidental result of corrosion. The distinctive obverse and reverse mark this as C. 106/7c, a rare coin not otherwise thought to be in the collection.
1000. Should be C. 102/2a.
1009. Someone has cut a **T** into the field (trying to make a **T. Q.** semis?), otherwise this is a normal coin of the type C. 86B/2.
1017. The style is wrong for **V**. Might the symbol be a dolphin?
1028. The reverse **S** is probably retrograde. A similar semis is in Paris.
1029. Uncertain.
- 1084–85. The weight implies these are C. 97/13d.
1091. The weight implies this is C. 97/3.

- 1098–1101. I am not sure how to distinguish C. 97/15 from C. 97/21. Coin 1101 is so light that it is probably C. 97/21, while the others are borderline.
1113. I see no signs of overstriking.
1118. There is a ∇ before the prow, but much weaker than the rest of the reverse. Coin 1118 seems too uncertain to support the existence of C. 97/22b. I have not seen the only other known example in Naples.
1124. The ∇ looks shaky, but there are no signs of tooling.
- 1126–38. There seems to be a fairly continuous range of obverse head size. I would unify C. 98A/1a and C. 98A/1c.
- 1199–1200. Should be C. 102/2a.
1220. Note the catalogue description.
1240. Should be C. 106/8b, with club behind head.
1242. Possibly an anonymous uncia, C. 41/10, but the designs are not entirely clear. Note the absence of the diagnostic waves on the hull.
- 1244–47. Should be C. 107/1b.
1264. Uncertain, but not an as with wreath, since the style is wrong.
- 1265–66. These two semisses are not clear enough to judge whether they are unofficial imitations or a light series of C. 110/3.
1268. Both obverse and reverse styles are wrong, note, for example, the obverse hair and helmet tufts and the reverse cape. The monogram shows no obvious signs of alteration but the field to its left has been thoroughly scraped. I cannot find another issue of similar style whose legend could have been altered to leave this monogram, so a full explanation eludes me.
1332. The last three lines belong to the description for 1333. Coin 1332 has S before the prow, and probably has inventory number 891 and a weight and die axis other than those duplicating 1333.
1362. The deckhouse is triangular on top.
1401. This is perhaps an imitation (note Janus's tilted faces).
1442. The legend is uncertain.
- 1445–47. These belong with the unofficial imitations 2787–2870.
1464. The deckhouse is triangular on top.
1485. The flat deckhouse is atypical for this issue.

1488. Uncertain.
1490. The reverse legend is as described and the deckhouse is probably triangular.
- 1504, 1506. Should be C. 198/1.
1524. Uncertain, but the bull and monogram appear to be altered.
1540. Uncertain as the coin is too damaged to be identified securely.
- 1555–56. The counterfeiter neglected to put the T in the monogram.
1572. The deckhouse is triangular, atypical for this issue.
1587. Probably a triens with Knife, C. 120/5.
1602. *RRC* fails to mention this variety with the mark of value above the prow. The deckhouse is triangular, another atypical feature.
- 1603–4. Coin 1603 belongs with the imitations 2787–2870, while 1604 is not clear enough to judge whether it is official or not.
1613. Probably an imitation that belongs with 2787–2870.
1657. The engraver forgot the lances in front of the horses.
- 1679–81. Should be C. 162/2c (explained above in text).
1698. The style is wrong and the monogram looks altered.
1708. Perhaps an imitation.
1727. Uncertain.
1747. Uncertain.
1807. The legend is as described.
1808. The first letter of **PVR** is uncertain, perhaps **T** or **P**. On the other known uncia (in Paris) the first letter seems to be a **T** rather than a **P**. Yet a **TVRD** or **L. TITVRI** uncia with **TVR** seems unlikely too. A clearer specimen is needed.
1816. The **S** in the reverse legend is retrograde (not noted in *RRC*).
1850. The **T** is present in the reverse legend.
1858. A barbarous imitation.
- 1880–81. Perhaps imitations?
1897. The style is wrong for C. 197–198b. The style seems too good to be imitative, so this may be a light anonymous issue not in *RRC*.
1921. The engraver forgot the deckhouse.
1938. The triangular deckhouse is atypical for this issue.
1994. The author points out that 1457 is a fake of M. Piccione. Ignoring the moneyers' names, however, 1994 has the same

dies as 1457, so 1994 is false too. Perhaps Piccione made a reverse hub to produce anonymous reverse dies to which he added moneyers' names.

2023. I cannot identify this as. Janus's head is reminiscent of C. 471/1.
- 2024–28. Coin 2024 is c. 214/3a, 2025–26 are C. 214/4a; 2027 is C. 214/5a, and 2028 is C. 214/5b.
2036. Probably an imitation which belongs with 2787–2870.
2044. Probably altered. The style of the prow is wrong for this issue; note, for example, the prowstem and wales. In addition **LIBO** appears garbled.
2062. The obverse style is wrong for this issue, but I cannot identify it.
- 2101–2. As the description indicates, the counterfeiters erred in putting **ROMA**, not **NOM**, in the exergue. To the extent that their condition permits determination, the coins appear to share the same reverse die.
- 2108–10. The obverse legend is **RVS**, not **RVFVS**. Also 2108 is C. 227/1a, while 2110 is C. 227/1d.
2116. Should be C. 229/1b, not 229/1a.
2192. Uncertain.
- 2237, 2239. The legend is **CN. DOMI**.
2258. Belongs with unofficial imitations, 2787–2870.
2274. Both obverse and reverse styles are wrong; note, for example, the reverse lettering and deckhouse. Perhaps false?
2282. An imitation. Note **DOPEIMI**, visor, Victory's wing, etc.
2326. Uncertain. Perhaps a C. **AVG** quadrans.
2344. The legend reads **DOMTI**.
2348. The first letter of the legend is uncertain.
2368. The moneyer's *praenomen* is **M**, not **Q**.
2370. Should be C. 263/1b.
2446. The **N** in the reverse legend is retrograde.
- 2484, 2490. The reverses of 2484 and 2490 have their photos switched. Even when the photos are properly placed, 2484 is not a **M. CIPI. M. F** semis, but is uncertain. For the style of Cippius see *NZ* 28 (1896), pl. 4, 86.
2495. Note the blundering of **O** in the reverse legend.

2670. The style is completely wrong for a Hammer as. Perhaps false.
- 2728, 2732. I suspect these form part of an official anonymous issue contemporary with C. 257. The semis, triens, and quadrans are known.
2822. Too worn for certainty. This may be a normal as semis.
- 2834-7. \mathbf{v} , not \mathbf{V} , before the prow.
- 2846-7. Probably L. **SAVF**, not L. **SAVF**.
2857. Uncertain.
2951. I cannot tell whether the object before the prow is a mark of value, a prow, or something else.
- 2984, 2986, 2988, 2990. These asses should be C. 342/7d-e, because it is unclear whether there is a palm branch over the leftmost prow.
- 2989, 2992. Coin 2989 should be C. 342/7c-d and 2992 C. 342/7e-f, because it is unclear whether there is a mark of value before the prow.
2995. Should be C. 342/8a.
3016. There is no mark of value above Janus, so *RRC*'s description should say that the mark of value is *usually* above Janus. Probably both obverse types will eventually be found with each reverse variety.
3026. This appears to be a **C.VIBI PANSA** semis, C. 342/8.
3034. Should be C. 346/1d.
3035. Should be C. 346/1a-b.
3040. Should be C. 346/4a.
3078. The control mark \mathbf{O} is uncertain.
- 3090-92. These belong with the imitations, 2787-2870.
3097. Perhaps an imitation.
- 3123-5. None of the letters on the side of the prow is clear. Do clear examples exist?
3131. The last **A** in **SALINA** is uncertain.
3132. The lettering appears reengraved and the letters **DSS** do not seem to be on the hull. Furthermore there is no crescent above the head of Janus, but a mark of value instead. Perhaps this is an altered L. **PISO** as?
3207. Should be XXVIII, not XVIII.
3222. The issue date should be 79, not 97 B.C.

- 3428–9. Not 2428–29. Coin 3429 should be C. 419/1e.
 3535. The obverse head and legend, and the reverse dolphin and scepter, are quite different from those on all other examples known to me.
 3645. Should be C. 469/1d.
 3646. Should be C. 469/1a.
 3680. Perhaps altered.
 3763. Should be C. 497/2a.
 3781. Should be C. 510/1.
 3873–5. The ♀ is lacking on obverse and reverse, as on all examples I have seen. Does C. 97/28 exist?

RICHARD SCHAEFER
 West Chester, PA

Ritrovamenti monetale di età romana nel Veneto (RMRVe).
 Padova: Editoriale Programma.

BRUNO CALLEGHER, *Provincia 2: Treviso*, vol. 2. Oderzo. 1992. 336 pp., 27 pls. ISBN 88–7123–173–2. L. 68,000.

MICHELE ASOLATI AND CRISTINA CRISAFULLI. *Provincia 6: Venezia*, vol. 3: *Chioggia*. 1993. 184 pp., 8 pl. ISBN 88–7123–165–1. L. 50,000.

MICHELE ASOLATI AND CRISTINA CRISAFULLI. *Provincia 6: Venezia*, vol. 2: *Venezia/Altino II*. 1994. 284 pp., 18 pls. ISBN 88–86413–01–7. L. 65,000.

ARMANDO BERNARDELLI, BRUNO CALLEGHER, GIOVANNI GORINI, AND ANDREA SACCOCCI. *Provincia 2: Treviso*, vol. 1: *Treviso*. 1995. Pp. 524, 11 pls. ISBN 88–7123–136–8. L. 78,000.

These are the first four volumes to appear in a project to catalogue all the coin finds of the Roman period from the region of the Veneto in northeastern Italy. The series is under the direction of Professor Gorini

of Padua University and 17 volumes are envisaged in all. So far they have been appearing at the rate of one volume a year, a commendable rate for a scholarly enterprise of this nature and a testimony to Professor Gorini's energy in driving the project along.

These volumes are particularly welcome as they represent the first systematic attempt to publish Roman coin finds from a Mediterranean country and thus represent a significant extension to the growing list of countries which have already started to publish their Roman coin finds in this way—Germany, Luxembourg, Austria, Slovenia, Hungary, and the Netherlands.

The volumes follow a similar format. A brief preface sets out the scope of the series which is to publish all coin finds of the ancient period, starting with the Greek and Celtic coinages and including the issues of the barbarian successor states until the Carolingian period and of the Byzantine empire until its fall. Hoards, stray finds, and coins from controlled excavations are all included. As one would expect, the great majority of the coins are from the Roman period.

Each volume has a short introduction discussing the sources of the coins catalogued before describing the coins themselves. Many of the coins are cited from previous literature and these entries are often uninformative. Each find group has a separate introduction and the catalogue section is completed by listing coins without a precise provenance. The volumes also contain excellent indices which list (a) hoards and coins from grave-finds; (b) unpublished varieties and other unusual features such as countermarks; and (c) all coins are listed by period and ruler. For the numismatic researcher these indices, particularly the last one, will be welcomed as providing a very useful numismatic summary of each volume. The first volume also contains a series of tables summarising the coins by period, but these have not been repeated in the later volumes.

Finally, selected coins are illustrated in the plates. Apart from the first volume, the plate section seems rather thin and they are also rather dark, but to have any plates at all is an improvement on the unillustrated German *Fundmünzen* volumes which provide the model for this series.

Since no publication of coin finds from a country or region can ever hope to be remotely complete, one might wonder what the value of a

project such as this is. There must be some question as to whether the recorded finds can safely be regarded as being a representative sample of the whole. On the other hand, in many countries so many coins are discovered that if they were all recorded in this manner such a series would rapidly become impossible. For example, a recent survey of metal-detector finds from England and Wales estimated that perhaps 400,000 objects made before 1600 are currently being discovered each year (Colin Dobinson and Simon Denison, *Metal Detecting and Archaeology in England*, Council for British Archaeology and English Heritage, 1995). If half of these objects are coins and two-thirds of those are Roman coins, then it is likely that well over 100,000 Roman coins are being found each year in England and Wales. The total number of coins found since the use of the metal detector became widespread could easily run into millions and, apart from coins in hoards, only a few have been recorded. Britain, of course, was a remote and not particularly wealthy province and therefore it is unlikely that more coins were lost there than in other wealthier provinces such as Italy. Although the British figures no doubt chiefly reflect the fact that there are more metal detectorists in Britain than elsewhere, they still provide a sobering reminder of the potential scale of the problem. In the meantime, however, we must rely on projects such as *RMRVe* to provide us with the best picture of Roman coin circulation that we can hope to get.

Clearly then this is an initiative to be welcomed. Italy is not known for its wealth of published coin finds and this series will go a very long way to redressing the balance, at least in one region of Italy. One must hope that scholars in other parts of Italy follow Professor Gori-ni's lead.

ROGER BLAND
British Museum

WILHELM HOLLSTEIN, *Die stadtrömische Münzprägung der Jahre 78–50 v. Chr. zwischen politischer Aktualität und Familienthematik: Kommentar und Bibliographie*. Quellen und Forschungen zur Antiken Welt Bd. 14, tuduv-Verl.-Ges., Munich, 1993. 424 pp., 8 pls. ISBN 3-88073-472-0. No price stated.

The study of the iconography of coin types has been muted in recent years, in part because of the debate over the problem of propaganda in the types has overwhelmed studies of particular coins (for a study of the problem, see R. Weigel, "Roman Coins: An Iconographical Approach," forthcoming). As a result, coin types are not readily used by ancient historians, classicists, and archaeologists. Hence Hollstein's book would seem to fill an unoccupied niche. Unfortunately, because of the organization of the book and the manner in which the conclusions are presented, I doubt it will serve this purpose.

The book is essentially the author's dissertation, only slightly reworked, completed by 1991, and in the introduction he apologizes for the literature since that date which he has not included. The introduction briefly sets up the problems the author addresses, especially the problems with chronology. The bulk of the book is a catalogue, consisting of references to older catalogues, descriptions of the types (which are rarely more detailed than those of Crawford), a discussion of the moneyer, and literature concerning the interpretation of the types, concluding with the author's theory (never more than a paragraph). His conclusions are basically stated in tabular form, including a list of the chronology of the moneyers, compared with that of Crawford and Hersh/Walker (*ANSMN* 29, 1984, pp. 103-34); a chart on the subsequent careers of the moneyers, with a short discussion of the implications of this information; a list of the presumed ages of the moneyers when they minted; then charts and his conclusions on the interpretations of the types in general; finally, a slightly more extended discussion of the types as they bear on the motivations of the moneyers.

The result is a book that some numismatists may find helpful. The raw material is widely available, but he has gathered it all into one place; still, Hollstein's original contributions might have reached a wider audience in article format. An even better approach would have been to throw away the catalogue format and integrate the coins into a chronological study that would have been more accessible to non-numismatists.

The period is a fascinating one. Never before or after is there the variety of types that are attested in this period when the structure of the Republican government itself was being tested and found wanting,

and the high level of quality in die cutting is never again found so systematically, or at least not until the high empire. No wonder these coins have fascinated scholars and collectors.

Hollstein is quite correct to point out (as have others, at least one of whom he cites in the introduction) that Crawford's *Roman Republican Coinage* (Cambridge, 1974) gives interpretations that are too brief and sometimes skips rapidly over major chronological problems. In fact, as Hollstein observes (p. 1), the problem is more acute because Crawford's book has become the standard reference. Moving on to the problem of the propagandizing content of coins, he cites appropriate literature, and though he does not argue the issue himself, he accepts the idea that coin types are propagandizing. Then he states (p. 3) that the number of dies per issue that Crawford estimates should be used to note primacy within the issue, suggesting that the first types struck are more important to the moneyer. He seems to drop this argument over the course of his book, which is probably not a bad thing—this argument is very weak, even if the order could be maintained.

Hollstein argues that a critical hinge to his argument is chronology (p. 5), as even Crawford admitted that the period in question was "the most difficult . . . to arrange satisfactorily." Hollstein writes that he paid particular attention to the Mesagne hoard published by Hersh and Walker though he did not accept the findings uncritically (p. 6). The later career of the moneyer is one of the considerations Hollstein makes in dating the coins. He supports the position that consuls often had a great deal to say about the appointment of the triumviri monetales (p. 7), and places the coin in the year when the moneyer's presumed relative was in office.

The catalogue is standard for a good dissertation, citing the history of the literature. There are few surprises buried in the mass of material presented here, as Hollstein generally supports interpretations offered by Crawford, even if he does expand upon the evidence. For instance, in his interpretation of the coins of L. Cassius Q.f. (Cr. 386), pp. 23–28, Hollstein offers more detail than Crawford in the subsequent career of Cassius, and interprets the types (head of Liber/head of Libera) as a reference to the Temple of Liber, Libera, and Ceres in Rome, and to *libertas* in general, which is the standard interpretation. He adds information about the temple, which can be obtained from

basic handbooks (e.g. Platner and Ashby, which Hollstein cites), and spends most of the entry writing about the tribunate in the years 78–75 (though he did not argue in any detail about the accepted date for the coin), concluding that the types are “anti-tyrannical.” Why Cassius would have been particularly interested in this theme is not addressed.

Hollstein occasionally does display considerable sensitivity to the iconographical questions. On the coins of Mn. Aquillius (Cr. 401, here pp. 108–11), which Crawford explains in two sentences, Hollstein works out in detail why Virtus (on the obverse) and the raising of the personification of Sicily (on the reverse) are used and what the political ramifications are in terms of Verres’s impending prosecution.

Yet Hollstein missed Moevs’s important article on the Ambracian Muses in his discussion of the coins of Q. Pomponius Musa (Cr. 410, Hollstein, pp. 171–80). M. T. M. Moevs (“Le Muse di Ambracia,” *BdA* 12 (1981), pp. 1–58) makes specific reference to the coin types and explains why Hercules is part of the group. In general, Hollstein seems tentative when discussing stylistic problems or the art and architecture of Rome. For example, in his discussion of the Basilica Aemilia (Cr. 419/3, Hollstein, pp. 227–30) he omits the important article by H. Bauer in *Kaiser Augustus und die verlorene Republik* (Mainz, 1988).

His conclusions are conservative: the moneyers are normally from established families from about 60 on, a fact which Hollstein links to Pompey’s abolition of the reforms of Sulla; the age of the moneyers is normally between 28 and 30. The charts that Hollstein offers here have already been produced in Crawford and H. B. Mattingly (“The Management of the Roman Republican Mint,” *AJN* 29 (1982), which Hollstein uses, but does not cite in that part of his conclusions.

More interesting is his analysis of the types, as “direct” and “indirect” propaganda. Although Hollstein did not have access to my book (*The Art of Persuasion*, Ann Arbor, 1992), he and I agree that a “double vision” is sometimes necessary to explain coin types. His analysis leads him to conclude that the types of the 70s commented on political circumstances (which he normally interprets as references to Sulla) and included few familial references—not surprising, since this is exactly the period when unknowns are minting coins. Refer-

ences to family themes become more conspicuous in the 60s and 50s, as references to the individual moneyer replace most other themes on coins, either by puns, the office of the moneyer, or tutelary deities. Moneyers refer to Pompey on the coins of the 60s until he leaves for the east, and by the time he returns references to individual moneyers and the moneyer's family have almost replaced all other interests on the coins. Although Hollstein's arguments are not entirely new, this is the most interesting part of the book. Not everyone will agree with his insistence on seeing references to Sulla or Pompey in many coin types (I myself remain skeptical in several cases, as Sulla especially seems to have far too many tutelary deities), but putting the coins in context and showing the pattern of the types is the most valuable part of his study.

The book is well produced, with clear photographs (not from the British Museum collection, which is refreshing!), though there are mistakes in some of the direct quotes I was familiar with. His notes sometimes include references that are not found in the bibliography at the end, and there is no index. In short, if this is the first book the reader picks up on the iconography of the coins of the period, he may find it helpful, as Hollstein does do a lot of gathering of sources. However, the more advanced reader may wish that the author had stretched himself more in placing these remarkably interesting coins in their context.

JANE DEROSE EVANS
Temple University

NIKOS KOKKINOS, *Antonia Augusta: Portrait of a Great Roman Lady*. London, Routledge, 1992. xviii + 254 pp., III ill. ISBN 0-415-08029-0. \$ 44.95.

Contrary to what one might expect from its title, *Antonia Augusta* is not a biography in the conventional sense, nor is it a study exclusively of Antonia's portraits or coins; it is, instead, an interdisciplinary approach to the evidence concerning this important woman's life and career. In his seven chapters, Kokkinos examines the following topics—literary and historical evidence for Antonia's life, inscriptions,

papyri, coins and tokens, sculpture, and architecture. Although only one chapter addresses numismatics, this is a book that numismatists will wish to consult when researching Antonia's coins, if only because Kokkinos has gathered all these sources of information into a single volume.

This interdisciplinary study represents two promising developments in archaeology and ancient history: a trend away from the narrow specialization that has become far too prevalent in all fields of scholarship, and another toward the study of women in history, not merely as adjuncts and accessories of the men in power but as significant historical players in their own right. Studies of portraiture and coinage of the Roman empire have conventionally been divided, in the past, into a long section on the portraits or coins of each emperor, followed by those of his sons and male relatives, and ending with a much shorter section on those of the women. This was, for example, the standard organization of the volumes of *Das römische Herrscherbild* until the 1980s. There is obvious justification for the conventional approach, in that the images of the head of state would have been the most widespread and the richest in political significance, while his relatives owed their public prominence and potential influence to his position. Nonetheless, there is much to be said for a study that focuses its attention on one of the people usually relegated to the back of the book, particularly when, as in the case of Antonia, her prominence spanned several principates and her actions sometimes reveal a personal and political agenda different from that of the *princeps*.

In his first chapter, Kokkinos advances the intriguing and provocative suggestion that when Germanicus and his family left Rome to travel through Greece, Asia, and Egypt, they were, in a very calculated manner, visiting the areas once controlled by Antonia's father, Marc Antony, and perhaps cultivating the loyalty of the peoples of those areas who still felt affection for his memory, just as his living children and grandchildren took pride in their distinguished descent (pp. 17–23). In the following chapters, he produces epigraphic evidence (pp. 42–43) and papyri that demonstrate Antonia's popularity in the Greek speaking areas and her very considerable economic power in Egypt, where she had apparently inherited extensive landhold-

ings from her father and from her husband Drusus (pp. 70–83). If Kokkinos is correct that the “Antonian” branch of the Julio-Claudian family flaunted their relationship to Antony and perhaps even intended to use it for political advantage, then the fear and suspicion with which Tiberius regarded Germanicus, and his motives for possible involvement in the death of his nephew, become far clearer. On a later occasion, however, Antonia appears to have acted as the loyal ally of Tiberius when she was instrumental in exposing the treasonable plot of Sejanus. In this episode, Kokkinos believes the conventional interpretation of Antonia’s actions to be correct, and disputes recent revisionist studies of the fall of Sejanus that have dismissed her involvement as a later invention by Antonia’s friends and descendants (pp. 25–26 and 42).

But while these chapters of Kokkinos’s book demonstrate the value of his approach, those dealing with the visual arts unfortunately also demonstrate its pitfalls. Although the focus on a single lifetime limits the chronological span to a manageable length, the breadth of evidence Kokkinos has committed himself to examining demands very wide-ranging research, and there are some inevitable gaps in the bibliography. For the interpretation of the Gemma Augustea, for example (p. 138), he cites the old Eichler-Kris catalogue of the gem collection in the Vienna Kunsthistorisches museum, but neglects W. Oberleitner’s much more recent *Geschnittene Steine: Die Prunkkammeen der Wiener Antikensammlung* (Vienna, 1985). The 1927 publication raises the suggestion that the female figure with two babies who sits on the ground next to the enthroned Augustus is a portrait of some woman of the imperial family, but most scholars today, including Oberleitner and many of the authors he cites, consider the figure to be a purely ideal personification of Tellus, or Italia. This is, in the context of the book as a whole, a minor omission, since Kokkinos discusses the Gemma Augustea only briefly in passing, but it is indicative of his tendency sometimes to use sources uncritically and to revive old theories that more recent scholars have rejected or viewed with skepticism.

Most numismatists will probably be quite surprised by his assertion that the three issues of dupondii from the reign of Tiberius that bear the reverses of Salus Augusta, Pietas, and Iustitia, all represent

Antonia, and refer specifically to her role in the fall of Sejanus (pp. 90–95). This notion has a very respectable pedigree: Mattingly (*BMCRE* 4, 1940, xvii–xviii, n. 2) raised the possibility that the tribunician date on these coins, TR P XXIII which seems to put the coins in A.D. 22–23, refers only to the year in which the Senate reauthorized the minting of bronze coins, not to the year in which they were actually struck. But Mattingly based this proposal on the evidence of a sester-tius with this tribunician date that bears the reverse of a *carpentum* and the inscription S.P.Q.R. IVVIAE AVGVSTAE, which he takes to refer to the death and the funeral of Livia in A.D. 28. The *carpentum* sester-tius could well refer instead to the ceremonies of thanksgiving offered for Livia's recovery from a serious illness in A.D. 22, in which case the tribunician date could be taken at face-value, while the identification of Livia with "the imperial good health," in its most literal meaning, would make perfect sense on another issue of the same year (Tac. *Ann.* 3.71). Kokkinos must also explain why another of the three issues of dupondii bears the names and titles of Drusus Minor, who was still living in A.D. 22–23, but had been dead for a decade in A.D. 33, to which Kokkinos would redate the three issues in order to place them after the fall of Sejanus. He interprets this coin as a commemoration of the tenth anniversary of the death of Drusus (p. 95), but there was a far more compelling reason for Tiberius to celebrate and promote his son while Drusus was still alive. The death of Germanicus in A.D. 19 had allowed Drusus to emerge as the obvious heir to the *imperium*, while the birth of his twin sons later the same year would have seemed to assure even more securely the succession of heirs of the emperor's own blood. There were, however, other potential heirs, namely the sons of Germanicus whose rights their mother Agrippina the Elder was vehemently promoting, and for that precise reason Tiberius had strong motives to seek popular support for his own son and grandsons by keeping their public images prominently visible. The three issues of dupondii with the Salus Augusta, Iustitia and Pietas reverses link the emperor and his son with the image of Livia, the most direct connection of both of them to the family of the deified Augustus. Kokkinos is entitled to disagree with these arguments for the dating of the issues and the identification of the Salus reverse as Livia, but his book does not really address or attempt to refute them.

In the chapters on sculpture and the minor arts as well, Kokkinos has been far too credulous in accepting as likenesses of Antonia virtually any object to which some curator or collector has attached her name. There is room for legitimate debate about the identity of the colossal Juno Ludovisi, which has entirely ideal features but an apparently Claudian coiffure (pp. 119–20, 79), or of a portrait type that survives in many replicas from Leptis Magna, Malta, Tyndaris, Athens, and Rome, among other locations (pp. 109–13, 73). The subject of the latter is clearly a woman of the imperial family, although I agree with K. Polaschek (*Studien zur Ikonographie der Antonia Minor* [Rome, 1973], pp. 39–45) that she cannot be Antonia Minor. But Kokkinos also accepts as portraits of Antonia several unique works of sculpture that conform neither to the profiles on her coins nor to the typology of her securely identified sculptural portraits. For example, a bust from Nomentum of an old woman has a coiffure entirely unlike any that Antonia is known to have worn (p. 128, 86), as does the so-called Clytie bust in the British Museum (pp. 126–27, 85). Kokkinos concedes that the latter may not be ancient, but suggests that it could be a copy of an ancient bust, which is possible. Again, however, there is no evidence that the hypothetical prototype represented Antonia, since the coiffure, with soft, full waves that partially cover the ears and long, escaping locks along the neck does not match the hairstyle on her coins or secure likenesses.

In the chapter on minor arts, Kokkinos follows C. Vermeule in recognizing several members of the Julio-Claudian family, including Antonia Minor, in the relief of a silver cantharos from Ephesus that illustrates an episode from Sophocles' *Chryses* (p. 140–43 C. Vermeule, *Roman Imperial Art in Greece and Asia Minor* [Cambridge, MA, 1968], p. 132). But Vermeule's photo comparisons of those figures with coin profiles of Drusus Minor, Germanicus, and Claudius, are unconvincing, and subsequent scholars have rightly treated this theory with skepticism. Finally, in the chapters both on sculpture and architecture, Kokkinos assumes on the basis of just one highly problematic reference that there was a temple to the Deified Antonia in Rome, the cult image of which may partially survive in the Juno Ludovisi (p. 119 and 146). Antonia was never, however, formally deified or worshipped as part of the state cult. It is possible that her relatives

and freedmen could have established a private shrine to her, as Domitia Longina's later did, or that cities of the Greek-speaking east independently established cults of Antonia (see e.g. p. 49), but Kokkinos does not adequately define the distinction between private and public apotheosis.

Kokkinos's willingness to accept so many identifications of Antonia in the visual arts and of monuments related to her points up another classic pitfall of biography, that of becoming infatuated with the subject and consequently of inflating his or her historical importance by over-interpreting the available evidence. Kokkinos is not immune to the dangers of sentimentality and he makes frequent references to the "beauty" of Antonia, although her physical appearance is almost entirely irrelevant to her historical role. Her marriage, although apparently very happy, was no love match, but a political arrangement, like that of any imperial woman. Unlike many other imperial women such as Julia and Messalina, Antonia did not use extramarital liaisons to pursue her own political advantage. References to her "beauty," then, serve only to make her more appealing to the modern reader. Consider also the following sentences (pp. 127–28) concerning the Clytie bust in the British Museum, the association of which with Antonia is, as indicated above, questionable at best: "Looking particularly at the 'Clytie' of the British Museum with Antonia in mind, we may be allowed to create the following imaginary picture: an idealised young woman of great beauty and Imperial status, in a sensuous or even erotic pose, who is emotionally involved but whose lover is fated not to be with her physically." Even if the Clytie does follow an ancient prototype, its provocative drapery and wilting, droop-headed pose are the stylistic elements most likely to have been introduced by an eighteenth century copyist.

Antonia Augusta is, in sum, a valuable but flawed work of scholarship. It will be a useful reference for many aspects of Antonia's history, including her representations on coins, but all scholars, and numismatists in particular, would be wise to approach some of Kokkinos's assertions with caution.

SUSAN WOOD

Oakland University, Rochester, Michigan

J. P. C. Kent, *The Roman Imperial Coinage*, vol. 10, *The Divided Empire and the Fall of the Western Parts AD 395–491*. London: Spink & Son Ltd., 1994. CLXXXII + 510 pp., 80 pls. ISBN 0-907605-43-5. \$ 180.00.

The appearance of this tenth volume in the *RIC* series completes the project inaugurated by Harold Mattingly and Edward A. Sydenham in 1923, which itself was an attempt “to present, in a form serviceable both to students and collectors, the coinage of imperial Rome” (p. vi). J. P. C. Kent’s magisterial contribution (he also did the eighth volume, published in 1981), is a worthy addition to the series. Volume 10 will be welcomed by students of the fifth century, and will stand alongside other reference works for this crucial and suddenly fashionable period, such as the *Prosopography of the Later Roman Empire* and the *Prosopographie chrétienne*.

The volume does much more than merely catalogue fifth-century coins. The prefatory material includes a massive bibliography (pp. xv–lix), a comprehensive list of obverse legends and bust types (pp. lxi–lxvi), a list of collections and excavations (pp. lxix–lxxx), an exhaustive and extremely valuable list of 365 hoards (154 gold, 45 silver, 137 copper, 29 mixed, but few adequately published, pp. lxxxi–clxxvii), and a list of sale catalogues consulted (pp. cxxviii–cxxxii; these sale catalogues perhaps would have been more appropriately included with the sale catalogues listed on pp. lxxvi–lxxvii).

The text proper begins with a “General Introduction” that covers topics such as “The Monetary System” (pp. 3–22), “The Mints” (pp. 23–41), “Types and Legends” (pp. 42–62). “Introductions to the Reigns” (pp. 63–219), divided into eastern and western emperors and organized by metal, and “Non-Imperial Coinages” (pp. 220–35). The catalogue proper ensues, taking up pp. 239–470, followed by comprehensive indices: obverse legends, obverse busts, legend types, Type/Legend, and 2 general index. The work concludes with 80 plates and charts of wreath types and monograms. One might note here that the Roman numbering system used for the 182-page introduction is awkward and pedantic. Many users might prefer, for example, to have had the list of hoards and the bibliography, with arabic numbering, in an appendix.

The beginning date for the volume was determined, of course, by the cut-off point of volume 9, that is A.D. 395. Regarding the choice of a stopping point, Kent begins by noting, "Everyone knows that a division between the 'Roman' and 'Byzantine' coinages has no absolute numismatic justification." But he continues, "However, the consensus of scholarship has long recognized that the reformed copper coins of Anastasius mark so fundamental and enduring a change" (p. vii) that 491 seemed a reasonable choice. As a result, this volume covers all but the last decade of the turbulent fifth century, and demonstrates in the coinage the profound changes that the empire underwent.

As for organization, Kent abandons the practice of volumes 6–9, which presented the coinage mint-by-mint from west to east, in favor of a chronological, emperor-by-emperor presentation for first the eastern and then the western halves of the empire. As a result some coins issued in the names of western emperors are included in the eastern section, and vice versa. Imitative series of coins, generally issued by the barbarian kingdoms of the west, also are included. Each coin in the catalogue has its own number. In this regard, one should note that the coins are numbered up to 3,817, but there are far fewer coins included because a block of numbers was reserved for each section, allowing for additions in the future. Each issue also is assigned a "frequency" number. Except for "R5" ("unique"), however, the significance of the values for frequency (which, one observes, include "C", "C2–3" [presumably "common"], "S" [presumably "scarce"], and "R", "R2–5" [presumably "rare"]) is nowhere given.

The discussion of "The Monetary System" makes several points that numismatists should note. For one thing, "the striking of a coin in an emperor's name did not necessarily cease at his actual date of death," for one can find "the ceremonial prolongation of the reign until the actual funeral" (pp. 3–4). The discussion of coin denominations (pp. 4–22), moreover, contains much detailed information and occasionally can be heavy going (sometimes the analysis seems a bit too condensed) for even the knowledgeable reader.

With regard to the gold coinage, Kent notes that "the exact weight of the Roman pound [and hence that of the solidus] is not known except approximately" (p. 7). Kent uses a pound of 324 grams,

giving the solidus, at $1/72$ pound, a nominal weight of 4.5 g, even though "a small proportion only actually survives at this full theoretical weight" (p. 12). Kent identifies gold denominations of 12, 9, $4\frac{1}{2}$, 3, 2, $1\frac{1}{2}$ (sesqusolidus), 1 (solidus), $1/2$ (semissis), and $1/3$ (tremissis) solidi. There also was an approximately $1\frac{1}{5}$ solidi piece, the *festareus*, a ceremonial continuation of the Diocletianic aureus ($1/60$ lb.). The multiples generally used standardized types throughout the period. Kent also observes that the much-maligned solidi Gallici of the mid fifth century "did not on average differ greatly from . . . the imperial pieces," although their weight admittedly "varies widely from piece to piece" (p. 5).

The silver denominations have special problems, especially the so-called *siliqua*, which, Kent suggests, was in fact never a true "*siliqua*" (that is, worth $1/24$ of a solidus) either in theory or in practice as it simply was too light. Nevertheless, "whatever the denomination may have been called, it is the normal silver piece struck . . . in the later fourth and most of the fifth centuries" (p. 16). The standard may have been rather less than 2.25 g ($1/144$ lb.) at the beginning of the fifth century. By ca. 430 it was down to about 2.00 g, and it fell to 1.30–1.40 g ($1/216$ lb.) a decade later. Only during the reign of Zeno (474–91) was the 2.00 g standard reinstated, a weight used also for the Vandal silver coinage of the same time. Other silver denominations included a $1/4$ lb. piece (known only for Priscus Attalus, 409–10); a $1/24$ lb. piece; the "heavy *miliarensis*" ($1/60$ lb.); the "light *miliarensis*" ($1/72$ lb.); the "heavy *siliqua*" ($1/96$ lb.); and the "half-*siliqua*" ($1/288$ lb.).

The term "bronze coinage" is used to refer to all base metal coinage, usually alloys of copper (primarily) with tin and lead. Kent's valiant attempts to explain the names of the various bronze coins *nummus*, *centenionalis nummus*, *decargyrus nummus*) and their values relative to each other and to the gold coinage provide some valuable clarifications, but also serve to demonstrate how thorny the problems of interpretation are.

The section of "The Mints" covers both the public and the palatine mints, all of which were administered by the *Comes sacrarum largitionum*. The *monetae publicae* were located in cities throughout the empire and operated by hereditary staffs of *monetarii*. As a result of

mint corruption, they were prohibited from striking gold and silver after 368. Gold and silver coinage came to be struck at palatine mints, that is, at the *comitatensis*, the residence of the emperor, wherever that might be. The *aurifices solidorum* (goldsmiths for solidi) worked in the *scrinium auri massae* ("Department of Gold Bars"); in the west a Comes auri (count of gold) presided over the operations. The gold came from the pure gold bars (*obryzum*) collected in taxes. In the east, the mintmark was the place of minting plus OB, e.g. CONOB, pure gold minted at Constantinople. In the west, it was generally COMOB, pure gold minted at the *comitatensis*, accompanied by letters indicating the mint city.

Mint cities discussed include Trier (until the 420s), Soissons (perhaps in the second half of the fifth century), Lyons (perhaps continuing under the Burgundians), Arles, Toulouse (Visigothic coinage), Narbonne (according to Kent closed under Honorius, but this ignores Sidonius Apollinaris's very clear reference [*Carm.* 23.41] to a mint at Narbonne in the early 460s, probably operated by the Visigoths), Nice (under Constantine III), Barcelona (under Maximus, 410–11), but Bracara, perhaps the mint of the Suevi, also has been suggested), Carthage (the curious *domino nostrorum* bronzes), Milan, Rome, Ravenna, Aquileia (until the late 420s), Siscia (until the 390s), Salona (perhaps ca. 475–77), Sirmium (until the 390s), Thessalonica, Heraclea (until the reign of Leo, 457–74), Constantinople, Cyzicus, Antioch, and Alexandria.

The coverage of "Types and Legends" covers, for obverses, under "The Emperor and His Portrait," topics such as "Beards," "The Nimbus," "Stars," "Draped and Cuirassed Busts," "Helmeted Busts," "Consular Busts," "Diadem and Wreath," "The Globe," "Obverse Titles and Names." For "Empresses," topics covered include "Titles and Representations" and "Names." For "Empresses," topics covered include "Titles and Representations" and "Names." For "Reverses," topics include "Roma and Constantinopolis," "Vota," "Imperial Marriages," "Chi-Rho and Cross," "Birds and Beasts," "Fortified Gate," and "Monograms." The section concludes with a discussion of "Language and Letters" and "Letter Forms."

The bulk of the remainder of the book is comprised by a long section, "Introductions to Reigns," which is followed by the catalogue

itself. The coverage of these sections is far too vast to discuss in detail here, and a brief review can only scratch the surface.

The "Introductions to Reigns" section includes brief summaries of the activities of each emperor and chronological overviews for each ones gold, silver, and bronze coinages. It is intended to parallel the catalogue, which lists only the coins without any commentary. As a result of this bipartite organization, one must constantly page back and forth between the introduction and catalogue sections. For example, the gold coins of Arcadius issued A.D. 397–402 catalogued on pp. 240–42 are discussed on pp. 64–65. While the reasons for including the commentary and catalogue separately are sound, doing so has resulted in some unfortunate complications. For example, the commentary and the catalogue are not always consistent with each other: the gold coinage of Arcadius given to Constantinople in the commentary (p. 63), for example, is attributed to Sirmium in the catalogue (pp. 239–40).

Additional inconsistencies and errors appears in the rubrics which are repeated at the beginning of each section in both the introductions and the catalogue. The rubrics are meant to list, in chronological order of date of accession, all those for whom coins were struck during the reign of each major ruler. One result of this policy is that the reader will seek in vain, for example, for a separate entry for the emperor Constantius III (421), who has been subsumed under the entry for Honorius. The reader also should note the omission in the reigns section, at the end of each rubric line, of crucial clarifying commas which are, however, included in the catalogue section.

Elsewhere, the text is replete with inconsistencies between the rubrics in the reigns and catalogue sections, which should be merely copies of each other. Some are merely venial, but others introduce actual errors. For example, also for the east, Aelia Eudocia's dates are given as "2 January 423–?late 443" on p. 73 but merely "from 2 January 423" on p. 252; in fact, Eudocia continued as Augusta until her death on 20 October 460, and Kent has coins being struck in her name perhaps as late as 450 (p. 270). Leo I's accession date of "?18 January 474" (p. 100) later becomes a certainty, "18 January 474" (p. 285). And Basilicus's rule is given in the rubric on p. 112 as lasting until "late August 476," but merely until "August 476" on p. 301.

For the west, on p. 317 (cf. p. 123), Honorius's joint rule with Arcadius should last until 1 May 408 and that with Theodosius should begin on 10 January 402. Constantine III rules until "August/September 411" on p. 143 (the correct date), but until "18 September 411" (the day his severed head reached Ravenna) on p. 347. One finds "Maximus of Barcelona" on p. 150, but simply "Maximus" on p. 351; and "Sebastianus" on p. 152, but simply "Sebastian" on p. 352. Placidia is dated "from 424" on p. 73, but "from c. late 423" on p. 253. And the rubric for Valentinian III (pp. 160 and 363) fails to mention Theodosius II or Marcian as co-emperors. Does Kent omit the eastern emperors because none of Valentinian's western mints (with the exception of Trier) struck coins for the eastern emperor at this time? If so, this should be clarified.

The rubrics for the western "shadow emperors" teem with inconsistencies. Petronius Maximus's should begin on 17 March 455 (p. 176), not 16 March 455 (p. 385). Leo's coinage in the west is said to begin on "7 February" (p. 182) but on "7 February (or later)" (p. 392); and his fourth period of western coinage should begin on "2 November 472" (the correct date) (p. 182), not on "23 October 472" (p. 397). Libius Severus's death date (pp. 189, 406) should be 14 November 465, not 25 September 465 (which is the date of an extant law he issued). Anthemius's accession and death dates should be 12 April 467–11 July 472, not 25 March 467–30 June 472 (pp. 193 and 411). Olybrius's dates are given variously as "April–2 November 472" (correct, p. 199) and "?March–23 October 472" (p. 422). Glycerius's dates are given as "5 March 473–19/24 June 474" (p. 201) and "5 March 473–24 June 474" (p. 424). His accession date, however, is more likely March 3, and he seems to have been deposed a bit before Nepos' accession on June 19/24 (*PLRE2*, p. 514). Julius Nepos' accession is given as "19/24 June 474" (correct, p. 204) and merely "24 June 474" (p. 427). The reign of Zeno in Italy is cited as "?October 476–7" (p. 215) and "Late 476–7" (p. 443).

For each emperor who has a separate entry, the various issues are organized on a basic pattern of metal (gold, silver, bronze), mint, date of issue, and denomination, although in the case of bronze and minor rulers such as Constantine III and Jovinus issues are organized by period and then by mint. Furthermore, the reader must be warned

that even the basic organizational pattern is often violated (note Leo and Leo II, for example).

In most cases, the issue periods are very narrow windows of just a year or two within a reign. In some instances, issues can be dated on the basis of vota numbers, consular iterations, imperatorial acclamations, or special events, such as accessions or marriages. In other cases, dates have been established on the basis of Kent's painstaking stylistic and die analysis. In only a few cases might one wish to date an issue more exactly than Kent has done, such as the coins of Constantius III (pp. 333 and 335), which surely must be dated to A.D. 421.

In a monumental work such as this, one can always find a few typos, e.g. "whet'her" for "whether" (p. 24), and "august" for "August" (p. 363), and one also notes some quaint turns of phrase, e.g. "imperial ladies" (p. 503).

One can only marvel at the amount of effort and dedication that clearly went into the production of this volume. Such work, of course, is never complete. A reworked edition of volume 1 appeared in 1984, and the revision of part of volume 5 (Valerian and Gallienus) is currently underway. Presumably, Volume 10, too, eventually will be revised to incorporate new opinions and discoveries yet to be uncovered. But, until then, the present volume will not only be infinitely useful to both scholars and collectors, it also will serve as a fitting monument to its author.

RALPH W. MATHISEN
University of South Carolina

ORIENTAL

ADEL ALLOUCHE, *Mamluk Economics: A Study and Translation of Al-Maqrīzī's Ighāthah*. Salt Lake City: University of Utah Press, 1994. 162 pp. ISBN 0-87480-431-0.

If this translation does nothing more than eliminate the common misunderstanding that al-Maqrīzī's *Ighāthah* is about famines, then Allouche will have achieved a great deal. Allouche's study goes beyond that, however, by providing a lucid and highly readable translation of this important Mamluk era economic treatise. While the translator's introductory analysis of Mamluk money must be used

with caution, those interested in medieval Mediterranean economic history will find this book a valuable addition to their library.

Taqī al-Dīn Aḥmad b. 'Alī al-Maqrīzī (d. 1442) was one of many contemporary chroniclers of the Mamluk regime of Egypt and Syria (1250–1517). His numerous works are well known to historians of the Mamluks, and his writings have attracted much interest, all the more so due to al-Maqrīzī's frequent criticisms of the ruling elite. It is in this context of al-Maqrīzī as critic that the *Ighāthat al-ummah bi-kashf al-ghummah* [Helping the community by examining the causes of its distress], written in 1405, should be understood. It is a polemical treatise (p. 13). In it al-Maqrīzī blames the Mamluks for Egypt's economic problems. Unlike earlier crises, which al-Maqrīzī states were all caused by natural phenomena (such as low Nile flood levels or insects), al-Maqrīzī believes that the current difficulties were caused by the "malfeasance" and "negligence of the public good" exhibited by Egypt's rulers (p. 24). While also condemning the Mamluk policies of selling offices and high taxation as contributing to the crisis (pp. 52–54), al-Maqrīzī devotes the bulk of his critique to the Mamluks' monetary policies, specifically their excessive use of copper coinage. If the Mamluk rulers were to abandon this copper money and return to the use of gold and silver, argues al-Maqrīzī, the troubles would cease (pp. 80–81). As Allouche points out (p. 13), al-Maqrīzī's concentration on economic and monetary issues is rare for the time, and it is these issues, and not famines, which are the true subject of the work (p. 5).

Allouche's translation is based upon the Cairo 1940 Arabic edition prepared by Ziyādah and al-Shayyāl (interlinear pagination with this text would have been a useful addition). The *Ighāthah* itself is a short work; in this book the translation fills but 63 pages. Following the lead of the text itself, Allouche has divided the translation into nine sections: Prologue; A Logical Premise; The [Years of] *Ghalā'* in Egypt; The Causes of Our Ordeals; [Currency]; A Description of the Population; Current Prices and Present Ordeals; The Means to Eradicate This Disease; and The Merits of This Proposal. The translation is preceded by a brief introduction (20 pages), and is followed by nine useful appendices: Measures, Weights, and Currency; Exchange Rates; Wheat Prices; Barley Prices; Bean Prices; Flour Prices; Bread Prices;

Mutton Prices; and Beef Prices. The last eight appendices provide numerous citations for the items in question for the period from approximately 1380 to 1405. Together with the ample notes that accompany the translation, these appendices are testimony to Allouche's familiarity with the Arabic literary sources.

As Allouche points out, his is not the first translation of the *Ighāthah* to appear. Gaston Wiet published a French translation entitled "Le traité des famines de Maqrīzī" in 1962 (*Journal of the Economic and Social History of the Orient*, vol. 5, pp. 1–90). Acknowledging the rather undeveloped state of the field in Mamluk economic history, Allouche provides his reasons for preparing another translation of this work (pp. 7–12). They are convincing. Chief among them is Wiet's misunderstanding of the Arabic word *ghalā'*, a word that appears often in the *Ighāthah*. Wiet translated this word as famine or dearth, no doubt contributing to his rather unfortunate title. But Allouche proves that in the Mamluk context, *ghalā'* refers to the appearance of excessively high prices for foodstuffs, regardless of whether they were caused by famine, shortage or "any other economic factor that causes prices to rise" (p. 11). Furthermore, Allouche gives a number of examples where Wiet's unfamiliarity with the Mamluk monetary system resulted in some problematic translations in the earlier work (pp. 8–9). While it is my belief that Allouche has also misunderstood some aspects of Mamluk money, these misunderstandings are manifest primarily in his introduction and end matter, and only infrequently in the translation itself.

Allouche's brief introduction to the translation promises both a "presentation and [an] explanation of a number of relevant issues" (p. x). After a short historical introduction, the introduction is broken up into five sections; Contemporary Views of the Early Circassians; The Date of al-Maqrīzī's *Ighāthah*; The Notion of *Ghalā'*; The Scope of the *Ighāthah*; and A Discussion of al-Maqrīzī's Views. My criticisms of the introduction and the analysis of the Mamluk monetary system found therein ultimately concern Allouche's use of source material. The Mamluk era is unique among medieval Islamic regimes in that it is rich in literary source materials. Allouche is well versed in these materials, and his notes provide frequent (and very useful) citations from other chronicles to corroborate al-Maqrīzī's accounts. Where Al-

louché's analysis falls short, however, is in the area of most interest to readers of this journal—numismatics. Mamluk coins survive in large numbers and should always be used as corroborative check on the literary sources. While Allouche makes frequent reference to Balog's corpus, *The Coinage of the Mamluk Sultans of Egypt and Syria*, ANSNS 12 (1964), it is clear from his discussion that he is not intimately familiar with the coins themselves. As a result, his brief analyses of Mamluk money should be treated with caution.

Mamluk money survives in large numbers, and thanks to the work of Balog and many others it is well studied. While Balog's work remains the standard reference, many of his conclusions have been challenged. It is no longer universally accepted, for example, that the Mamluk monetary system was ever "based" on any particular metal. The numismatic record is quite clear that coins of all three metals were in existence throughout the entire Mamluk period, albeit subject to temporary shortages and frequent changes in supply and demand. Thus, when al-Maqrīzī alleges (p. 71) that silver coins were no longer minted in the reign of the sultan Barqūq (1382–99), and Allouche states that silver was no longer minted by "about" 1403 (p. 15), the numismatic evidence indicates that these scenarios were either not true or only temporary interruptions. Furthermore, merely because one particular coin was more commonly cited in price quotations or exchange rates does not mean that it was the "basis" of the system, merely that it was the common currency at that time. Exchange rates, by definition, require the presence of two types of money.

Allouche's frequent assertions that the Mamluk monetary system was based first on gold and silver and later on a copper "dirham of account" (pp. 15–20) should therefore be discounted. Allouche makes frequent reference to a supposed decision made in 1403–4 to "base the monetary system exclusively on the dirham of account" (p. 17). This conclusion is warranted by neither the numismatic nor the literary evidence. The first passage from al-Maqrīzī's longer historical chronicle *Kitāb al-Sulūk* (3:1111–1112) cited by Allouche in support of his assertion mentions only that copper was to circulate by weight and not by tale, and gives the new exchange rate. This was not a new development, for such decrees had been made several times in the previous century. A second passage cited from the *Sulūk* (3:1117) indicates

that it had been made acceptable to pay fees and taxes in the copper coins. There is nothing in either passage to prove that the use of coinage made of metals other than copper ceased. As al-Maqrizī was himself aware, silver coins were still in existence, as proven by his mention of exchange rates for coined silver (p. 78), and of the common practice of hoarding silver (p. 81).

A second issue concerns Allouche's use of monetary terminology. In his preface (p. x), Allouche rightly acknowledges the tremendous difficulties encountered in understanding Mamluk monetary terms. These terms are used inconsistently in the sources and frequently have multiple meanings. These problems are seen especially in the Arabic phrase *dirham/dirāhim min al-fulūs* found in many Mamluk era texts. Separately, the word *dirham*, plural *dirāhim*, may refer to either a silver coin or a weight unit, while *fulūs* almost always refers to copper coins. But as Allouche points out, when these words are linked together the resulting phrase has caused much confusion among modern scholars. It has been interpreted in many ways, ranging from the assumption that it still referred to a silver coin to the definition that it was a copper coin weighing a dirham. Neither of these is correct. The phrase refers to a unit of account, and it means the amount of copper coins necessary to achieve the equivalent value of one silver coin. Both Popper and Balog realized that it was a unit of account, although the repercussions of this realization did not percolate through the works of either scholar. Allouche rightly recognizes this term as a unit of account, and his translation is the better for it.

Throughout the book, however, Allouche renders *dirāhim min al-fulūs* as "dirham of account." While this usage is better than Popper's "trade-dirham," it is still problematic. Contrary to Allouche's belief, this "dirham of account" was not the only unit of account in use in the Mamluk domains (pp. 9 and 17). Given the extremely irregular weights of all Mamluk gold and silver coins struck before the reform issues of the 1420s, it is known that these coins were weighed for all transactions. The value of the weighed amount of coins was then determined by comparison to their respective units of account. Thus Mamluk money was no different from other contemporary monies in that it consisted of two parts: the coin itself and the unit of account

by which the coin was valued. The inherent problem of Allouche's use of "dirham of account" for *dirāhim min al-fulūs* is that this phrase could easily be confused with the unit of account specific to the silver dirham. A more accurate and less misleading (albeit inelegant) rendering of the Arabic would be "a [silver] dirham's worth of copper coins." Better yet, why not use the transliterated Arabic phrase itself?

My remaining comments are minor. In his correction of Wiet's translation of a passage set in the year 1399 (p. 8), Allouche alludes to copper coins weighing one dirham each. While the mathematical analysis of the passage is correct, it must be pointed out that the numismatic evidence clearly shows that the weight standard for copper coins at the end of the fourteenth century was the heavier mithqāl and not the dirham.

In the translation, the following items should be noted. In al-Maqrīzī's discussion of early Islamic coinage (p. 63), Allouche translates the Arabic *fa-kataba 'alayhā al-sikkah al-'abbasīyah* as "and [he] inscribed the words 'Abbasid coinage' of them." While the word *sikkah* can and did mean coinage, its first meaning was the actual die used to strike the coin, as Allouche indicates in appendix one (pp. 91–92). By extension, the term may also be linked to the actual legend engraved in the die. Since the appearance of the word *sikkah* on any Islamic coin is quite rare, a more contextual rendering of the passage would be along the lines of "and [he] inscribed Abbasid legends (or even propaganda) on them."

Next, it is known that al-Maqrīzī frequently made mistakes, and Allouche points this out on several occasions (p. 56, n. 3, and p. 64, nn. 54 and 60, to give only three examples). In one case, however, Allouche goes beyond noting an error and corrects it in the text of the translation itself, thereby providing a degree of exactness not found in the original. This occurs in al-Maqrīzī's discussion of the change in the weight standard of the copper coinage from the dirham to the mithqāl (p. 70). This transition is known by both the numismatic and literary evidence to have occurred in the year 759 of the Islamic era (1357/8 A.D.). In the Arabic text of the *Ighāthah*, al-Maqrīzī states only that it occurred "after 750." Allouche gives the precise date of 759 in his translation. Since al-Maqrīzī wrote that he composed the *Ighāthah* "in a single night" (p. 83), the lack of specifi-

city exhibited by "after 750" would seem to be a sign of such rapid composition. In order to preserve this rather hurried quality, the exact date would have been best put in the notes. Further, Allouche correctly notes that the reading of "after 650" made by the editors of the Arabic text is in error. Inexplicably, however, he repeats their error in his discussion of the fulūs found in appendix one (p. 91). There is no evidence, numismatic or literary, to support his assertion that Mamluk fulūs weighed a mithqāl between the years 650 and 695 of the Islamic era (1252–96 A.D.).

Finally, it should be pointed out that many students of Mamluk economic history have reached a different interpretation that that offered by al-Maqrīzī for the causes of the Mamluk economic problems. This interpretation was succinctly stated by Udovitch in his 1970 review of Balog's corpus (*Journal of the American Oriental Society* 90, p. 290), where he warned against attributing an exaggerated importance to monetary matters in explaining Mamluk Egypt's economic difficulties. In Udovitch's words, "the causal relationship was quite the reverse. It was not debasement or any other monetary dislocation which caused the economic decline of the late fourteenth and fifteenth century Egypt, it was rather the underlying economic pressures which were at the root of the monetary difficulties. [These difficulties were all] symptoms of a more basic economic malaise, viz., the severe demographic decline beginning in the latter half of the fourteenth century combined with Egypt's persistent unfavorable balance of trade with the Black Sea Region and with India." These comments should be kept in mind lest the reader be swept away by Allouche's flowing translation of al-Maqrīzī's polemic.

WARREN C. SCHULTZ
DePaul University

JOHN E. SANDROCK, *Copper Cash and Silver Taels*. Monkton, MD: Bunker Hill Enterprises, n.d. 408 pp., 9 maps, 12 tables, 182 figs. No price stated.

Despite its title, the focus of this book is on Ching Dynasty paper money. About 110 specimens are reproduced and every source is

considered: official and quasi-governmental issues, notes from government and large and small commercial banks, foreign bank notes, and military and revolutionary issues. Related topics are covered, such as printing techniques, authentication, numbering, and overprints and endorsements. The discussion is authoritative, and a comprehensive bibliography is included. (The bibliography was presumably prepared too late to include the monumental *A Monetary History of China* by Ping Xinwei, translated by Edward H. Kaplan, which is authoritative on paper money and everything else.)

But this book is about much more than paper money. It includes brief histories of the Ching Dynasty in its historical setting and of Chinese numismatics in general. As the title suggests, the book also describes in some detail the coinage of the Ching Dynasty. It does not attempt to offer as comprehensive a catalogue of coins as it does of paper money (to the degree practicable), but it clearly and with wry wit discusses the confusion and lack of standardization in the Ching copper and silver coinage (a hilarious newspaper description of the tactics of Chinese moneychangers is included). The book also includes informative discussions of Chinese banking, economic and business practices, and a history of Chinese trade with the west.

Copper Cash and Silver Taels is very accessible. It is profusely illustrated and written in a clear, informal, and entertaining style. Even better, the book has an unusual sense of presence: it brings its material to life. Among the ways it does so is by extensive quotation from a 1876 Shanghai newspaper, and by printing numerous photographs taken in China about 1900.

Unlike most numismatic books, however, the book has drawbacks which a professional review process might have eliminated. For instance, although there is an extensive bibliography, there are no footnotes or references to sources of further information on specific subjects. In addition the author has chosen to use the obsolete Wade-Giles transliterations instead of the current Pin Yin. As he says, this makes it easier to quote Ching dynasty sources, but it impedes the book's usefulness to the increasing number of potential readers who will be familiar only with Pin Yin. There are inaccurate generalizations, especially in the picture captions, but accurate statements in the text generally keep the reader from being misled. On

p. 89, however, the book says of certain song Dynasty coins that they are "the first example of specific coin dating that the world had ever seen." Most numismatists know that ancient Phoenicians and hellenistic kings were putting year dates on coins in the second century B.C. There are also some incorrect words and spelling errors.

PLATES



Tetradrachms of Agathocles

Plate 2



Tetradrachms of Agathocles

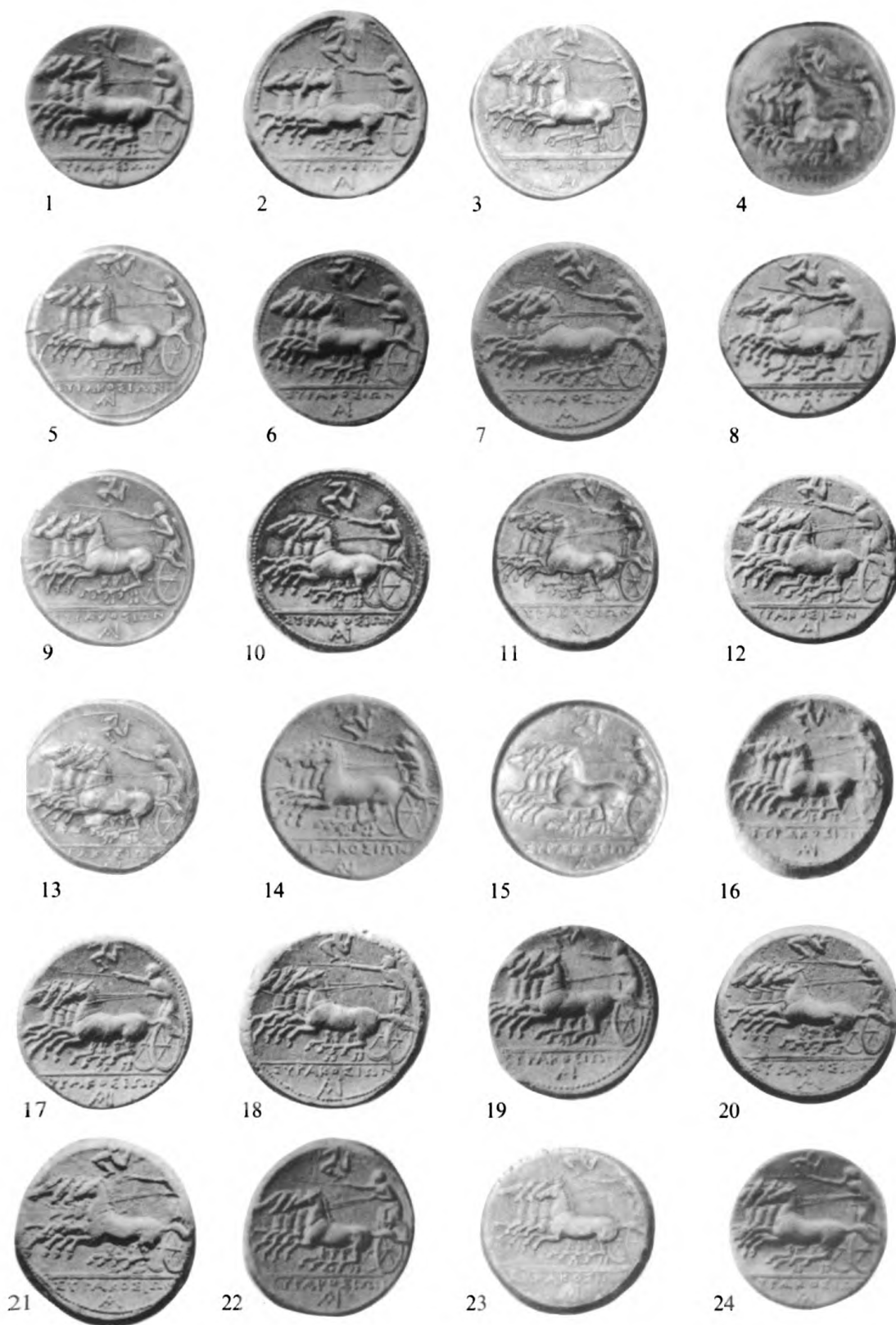


Tetradrachms of Agathocles

Plate 4



Tetradrachms of Agathocles



Tetradrachms of Agathocles

Plate 6



Tetradrachms of Agathocles



49



50



51



52



53



54



55



56



57



58



59



60



61



62



63



64



65



66



67



68



69



70



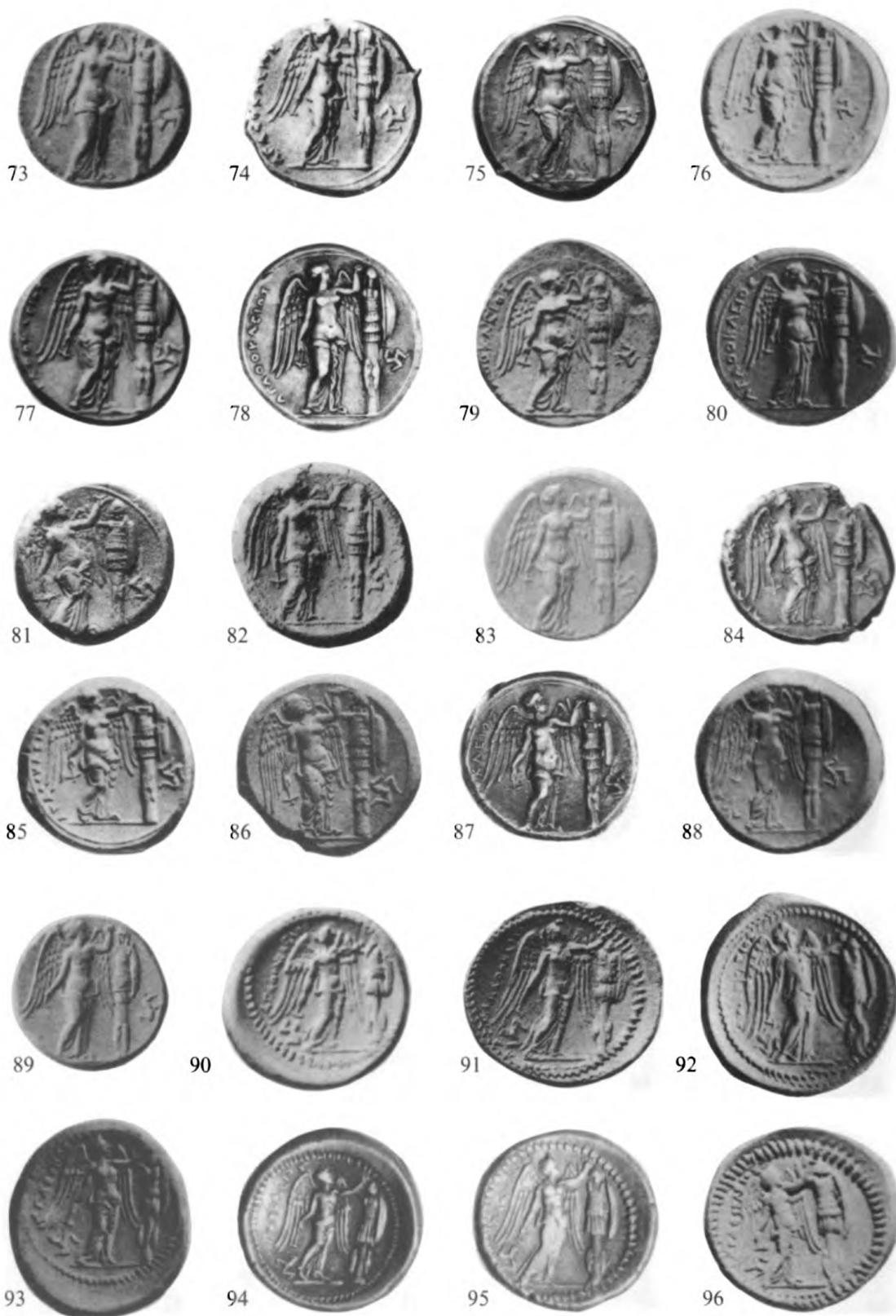
71



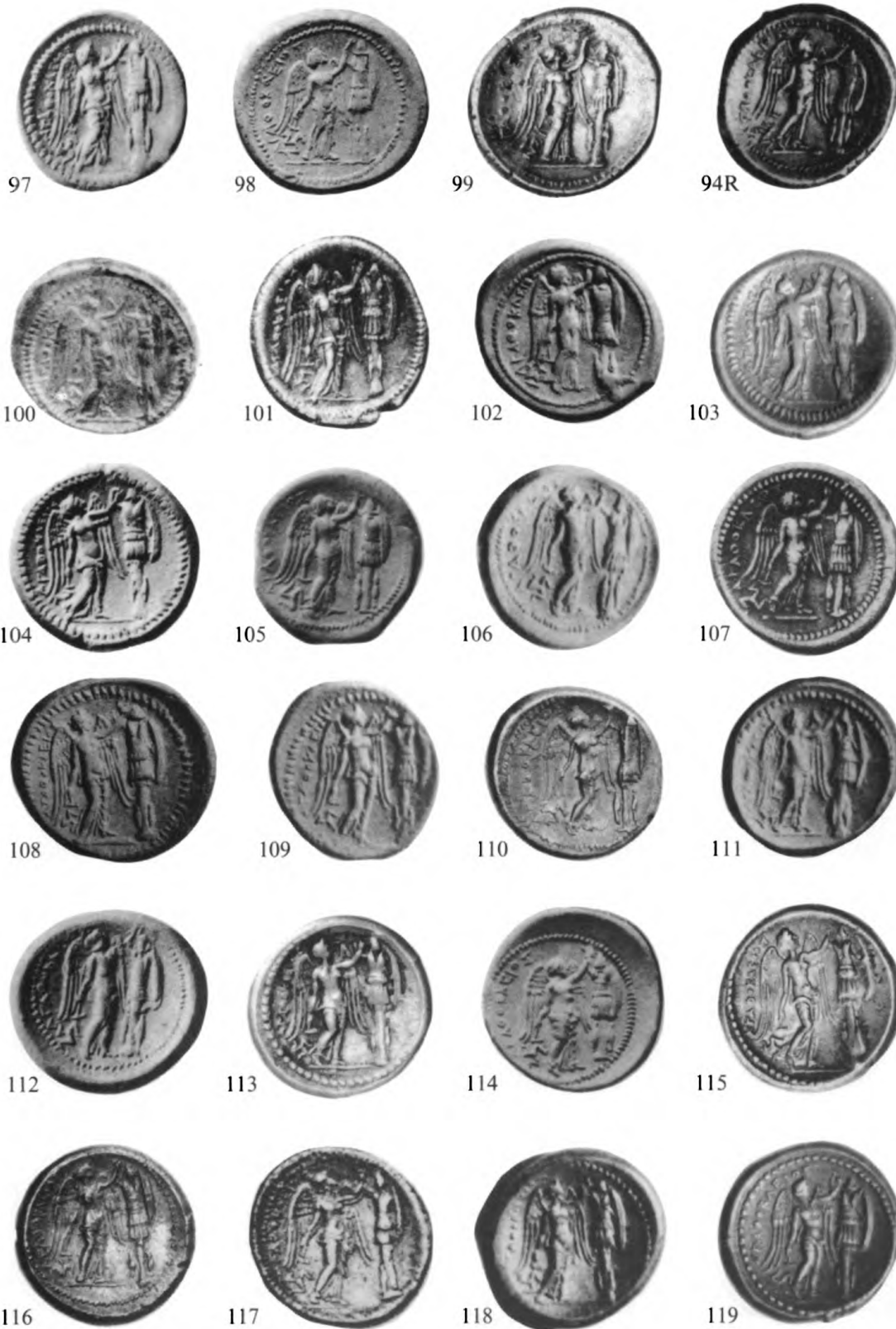
72

Tetradrachms of Agathocles

Plate 8



Tetradrachms of Agathocles



Tetradrachms of Agathocles

Plate 10



120



121



122



123



124



125



126



127



128



129



130



131



132



133



134



135



136



137



138



139



140



141



142



143

Tetradrachms of Agathocles



144



145



146



147



148



149



150



151



152



153



154



155



156



157



158



159



160



161



162



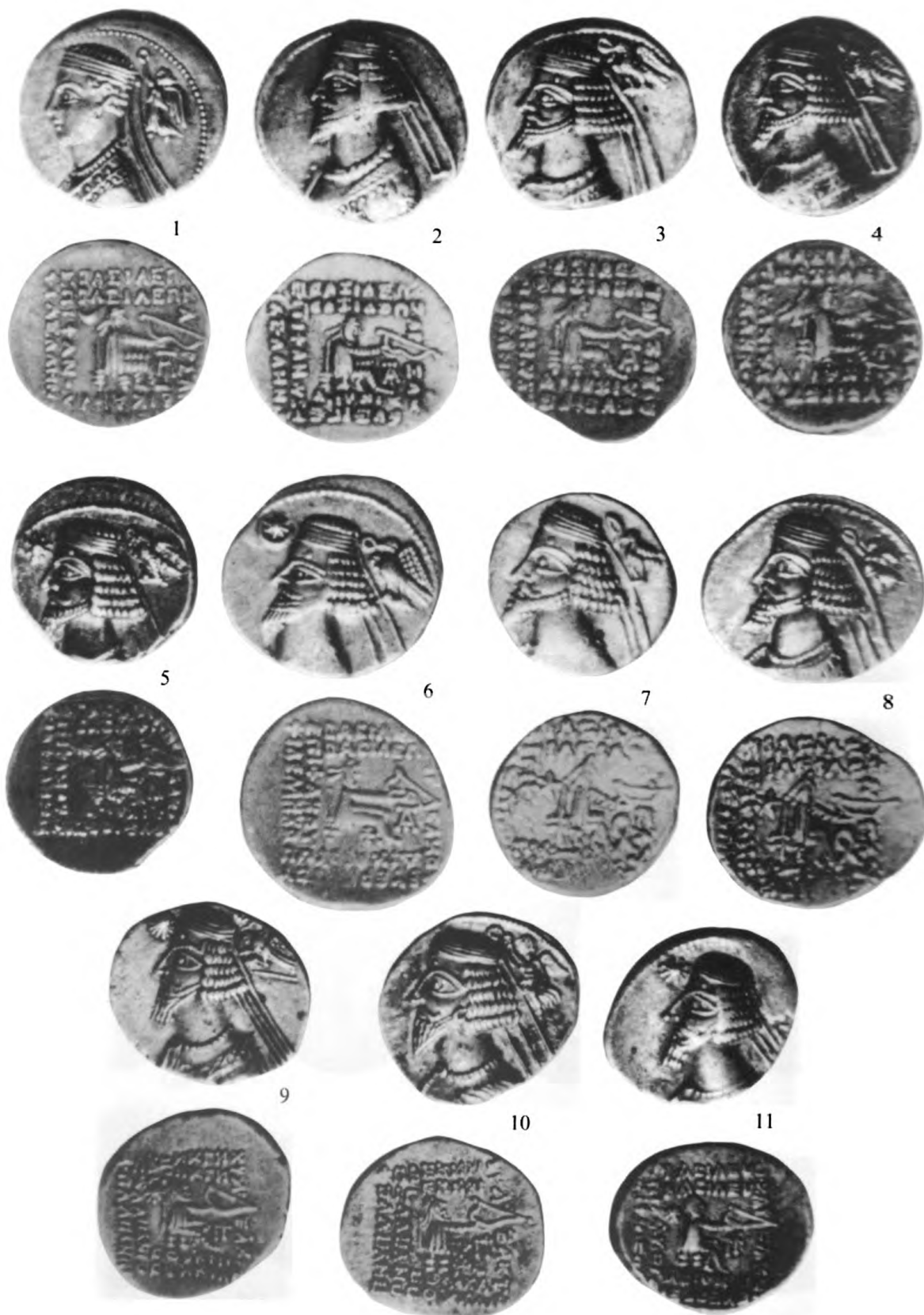
163



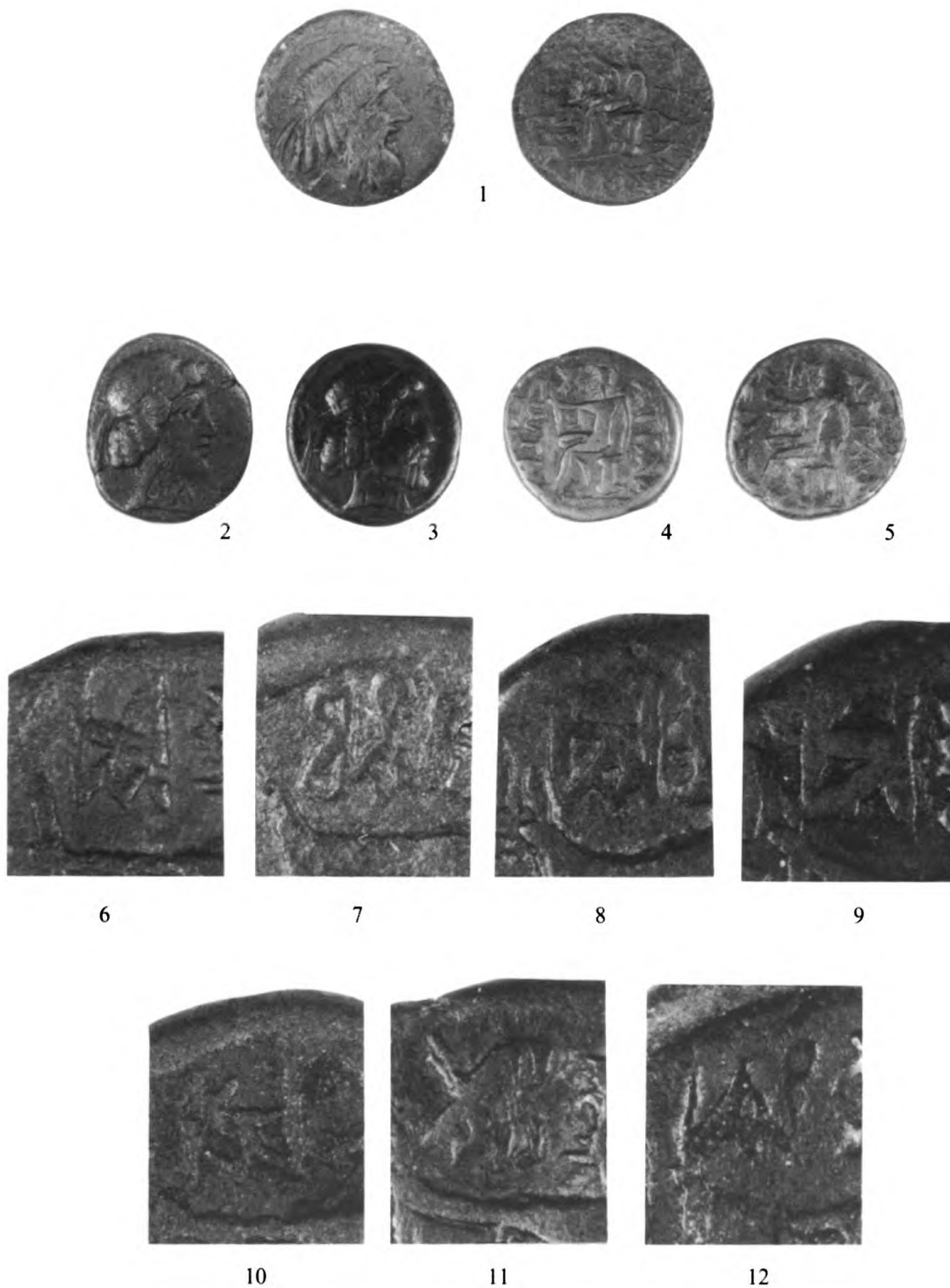
164

Tetradrachms of Agathocles

Plate 12



Phraates IV



Countermarked Tetradrachms of Attambelos IV

Plate 14



13



14



15



16



17



18



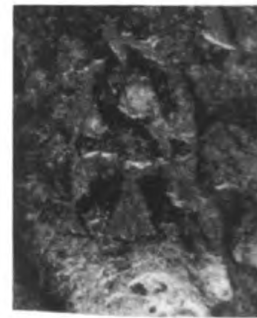
19



20



21



22

Countermarked Tetradrachms of Attembelos IV



Vespasian's Syrian Coinage

Plate 16



14



15



16



17



B



C



18



D



19



20



21



23



Vespasian's Syrian Coinage



Vespaian's Syrian Coinage

Plate 18



Vespasian's Syrian Coinage



Vespasian's Syrian Coinage

Plate 20



71



72



77



80



83



84



85



86



87



88



89

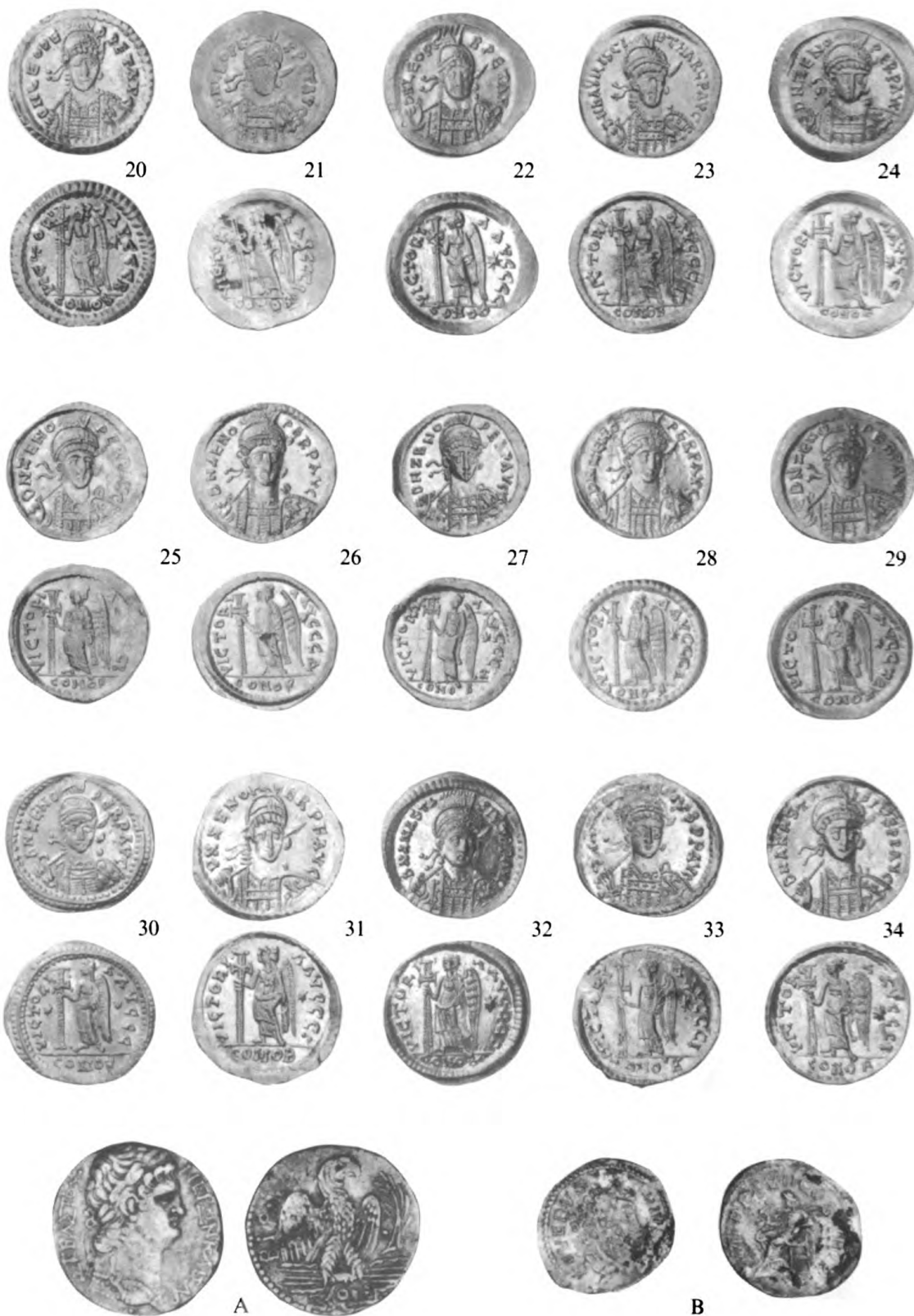


Vespasian's Syrian Coinage



Tell Nimrin

Plate 22

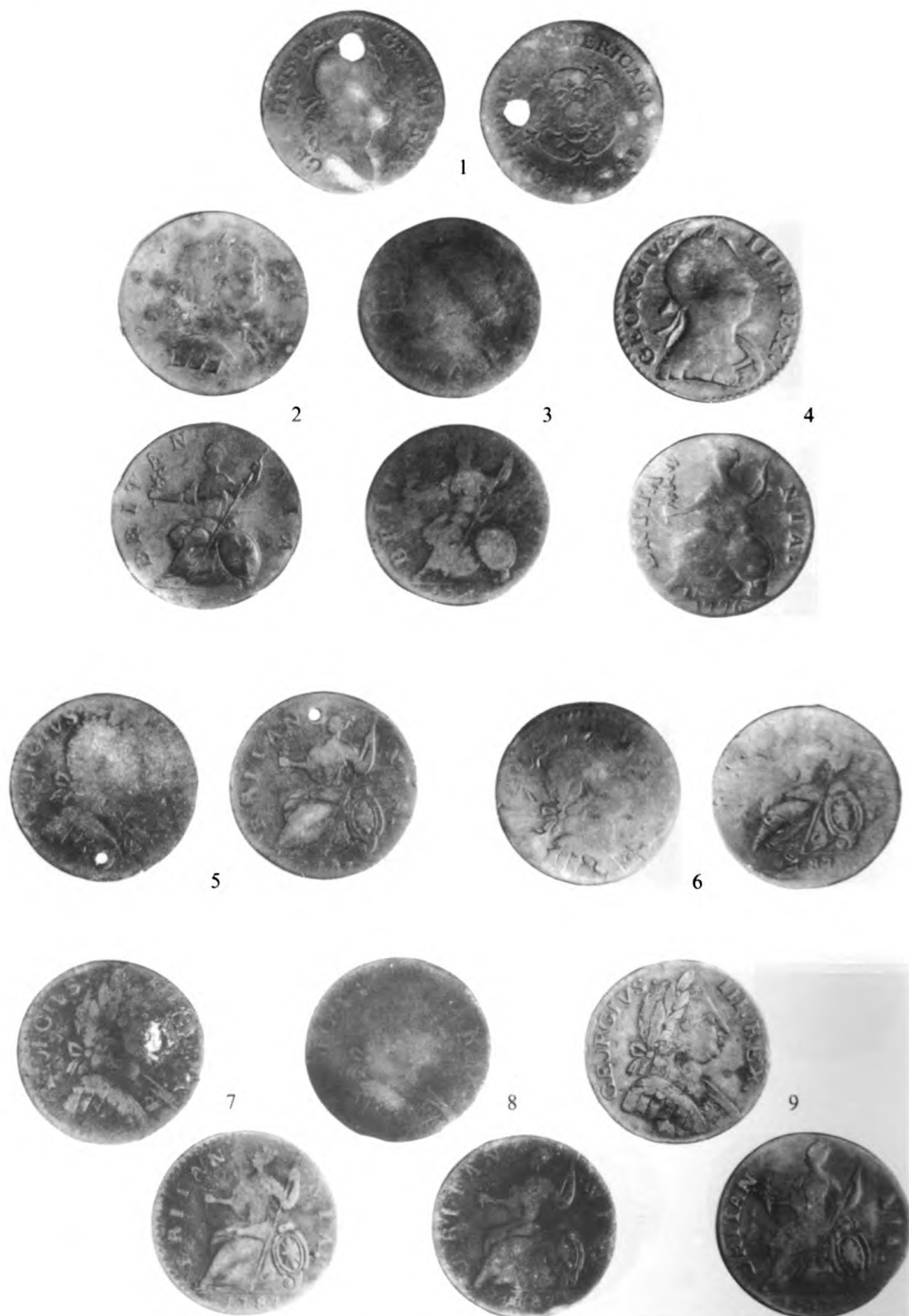


Tell Nimrin



Anatolian Seljuqs

Plate 24



Beach-Grünthal Hoard



Beach-Grünthal Hoard

Plate 26



Beach-Grünthal Hoard



32



33



34



35



36



37



38



39



Beach-Grünthal Hoard

Plate 28



1



2



3

Imitation Silver



4



5



6



Imitation Silver

Plate 30



Imitation Silver



11



12



13



14

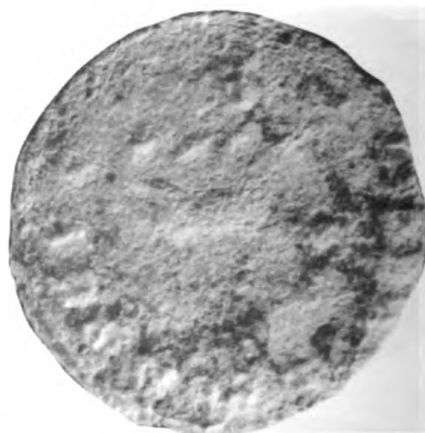


Imitation Silver

Plate 32



15



16



17



Imitation Silver

